The Builder.

VOL. LXXXIV.—No. 3142. APRIL 25, 1903.

ILLUSTRATIONS.

Detail of the Central Door of the Cathedral of Siena.....From Photograph.
S. Giovanni and Palazzo Micheletti, from Cathedral, Lucca.....Drawn by Mr. Frank T. Verity, F.R.I.B.A.
Palazzo Contarini, Venice ..... " " "
Hull School of Art.....Messrs. Lanchester, Stewart, & Rickards, Architects.
House near Skibbereen, Co. Cork.....Mr. R. S. Balfour, A.R.I.B.A., Architect.
Selected Design for Free Library, Kettering .....Messrs. Goddard & Co., Architects.

Blocks in Text.

Hollybrook House, Skibbereen, Co. Cork..... Page 436.

CONTENTS.

Railway Traffic 425
Christian Archæology in Rome 428
Notes 428
The Royal Institute of British Architects 431
Builders' Clerks' Benevolent Institution 434
Competitions 434
Archæological Societies 434
Applications under the 1894 Building Act 435
Illustrations:—
Detail of Central Doorway, Siena Cathedral 436
S. Giovanni and Palazzo Micheletti, from Cathedral, Lucca .. 436
Palazzo Contarini, Venice..... 436
Art School, Hull 436
Hollybrook House, Skibbereen, Co. Cork 436
Free Library, Kettering 436
Architectural Societies 436
Books:—J. C. Trautwine's "Civil Engineer's Pocket Book"; L. J. Johnson's "Statics by Algebraic and Graphic Methods"; M. A. Green's "Eighteenth-Century Architecture of Bath"; G. Hastings's "Siena: Its Architecture and Art"; W. Benham's "Old St. Paul's Cathedral"; W. G. Gulland's "Chinese Porcelain"; A. Fea's "Picturesque Old Houses"; J. E. Gore's "The Stellar Heavens" 437
Trade Catalogues 439
Correspondence:—
The Public Health Acts 439
The Ventilation of Schools 440
Quantity Surveyors' Association 440
Re Maidenhead Free Library 440
Books Received..... 440
General Building News 440
Sanitary and Engineering News 441
Foreign 441
Miscellaneous 442
Capital and Labour 44
Legal:—
Action by Architects 442
Workmen's Compensation Act Cases 443
Sunderland Building By-laws 444
Patents of the Week 444
Meetings 444
Some Recent Sales of Property 445
Prices Current of Materials 445
Competitions, Contracts, and Public Appointments 446
Tenders..... 447

Railway Traffic.

WITHIN the last year or two we have heard a great deal about the management of British railways, largely from irresponsible and unqualified writers in the daily Press. People of this class are usually gifted with wonderful facility for writing fluently upon subjects which they do not in the least understand; they also suffer from the peculiarity that everything which originates in the United States seems to them to be better than anything originated or practised in this country. We have been told that American railway methods must be imitated, or the country will necessarily go to the dogs, and the same sermon is still preached. The fact is that Americans have always been, and still are, perfectly willing to learn from us. Much of their knowledge was originally derived from this country, but modifications in points of detail were introduced in order that practice might be assimilated to local requirements, and in course of time new developments have been made, some of which are worthy of adoption in Great Britain, and others are not. On our own side, we should preserve open minds, permitting us to select and to adopt any really useful idea that may emanate from America or elsewhere. So far as railway management is concerned, we feel sure that such an attitude is actually that of the most intelligent and enterprising railway officials in the country. Representatives of northern and southern railways have recently visited the United States, with the result that various improvements are now in course of introduction upon our own lines, but it should be clearly understood that nothing approaching the Americanisation of British railways will be attempted, simply because the traffic conditions of the two countries are essentially different.

To those who desire trustworthy information upon the subject, which is of the utmost importance to the nation at large, we commend a perusal of the recent "Report on a Visit to America," by Col. Yorke, R.E., Chief Inspecting Officer of Railways.* The Report, which has already occasioned much comment in the daily papers, is directed chiefly to the construction and equipment of (1) steam railroads; (2) surface lines, or tramways, subways, and elevated railways; and (3) high-speed electric inter-urban railways.

Taking these main divisions in order, we may first point out that an essential difference exists between the modes of construction followed in England and America. Americans claim "that their permanent way is easier and quicker to lay, cheaper to maintain, smoother to run over, and as durable as the English type." As American railway engineers invariably employ the T-rail, simply secured to the sleepers or ties by spikes, it may be admitted that the laying of the lines ought to be particularly cheap, even after allowing for the closer spacing of the sleepers. American sleepers are invariably of hardwood, and such material is essential for the form of construction in question. Probably hardwood may not cost more in the United States than soft wood does in Great Britain, but the adoption of the former material in this country would clearly involve additional expenditure, and the opinion expressed in the Report is that "there would probably be no economy in England in adopting American practice, for the extra cost of the ties would more than balance any saving due to the omission of chairs." It must be added that at all places where there are curves or switches, it becomes necessary, on the American system, to use "rail braces," or small steel brackets, to support the rails, and, owing to the great weight of modern engines, it is becoming usual to employ bearing plates, or tie plates, between the rails and the ties to increase the bearing of the rail on the tie and to afford mutual support to the spikes. These details constitute a considerable approach to a chair road and are further sources of expense. Moreover, the effect of the tie plates is to shear off the heads of the spikes—a very undesirable result. The fact that such additions are necessary shows, as Colonel Yorke remarks, that the American mode of construction is lacking in certain elements of stability which are inherent in the English type of permanent way.

With regard to the claims made on the score of maintenance and durability, there seems no reason to infer that American methods can give the slightest advantage; indeed, cheapness of construction is generally incompatible with durability and true economy. Colonel Yorke admits that railway travelling in America is smooth and quiet, a feature which he attributes partly to the road, and partly to the invariable use of long and heavy bogie carriages. On the occasion of a seventy-mile trip from New York, he was particularly struck with the smoothness of the track and the absence of noise and vibration, and similar evidence is forthcoming from other engineers who have inspected American railways. In the spacing of rail joints so as to "break joint," American practice presents a feature worthy of consideration by engineers in our own country, who make the rail joints on each side of the track opposite each other. On the other hand, American engineers would do well to follow our example to some extent by the adoption of screw fastenings for the rails in place of the primitive spikes at present used.

Turning now to signalling, which we are sometimes told is very inadequately understood in Great Britain—or, at any rate, is in an extremely backward state—we find that Colonel Yorke was not particularly impressed by what he found in the United States. He says:—

"Signalling in America is in an inchoate condition, there being no uniformity of practice throughout the country. Some portions of the principal railroads are fully signalled, but on many others hardly any signals are used, and even where signals are used, their shapes, colours, and meanings vary upon different lines. Similarly with block working, only about 25,000 miles out of a total mileage (measured as a single track) of 200,000 are at present worked in America on the block system, but its use is being gradually extended. Block working, however, is not so strictly interpreted as it is in England; two or more trains are constantly permitted to be in the same section at the same time

* "Report on a Visit to America." By Lieut.-Colonel H. A. Yorke, R.E. London: Eyre & Spottiswoode. 1903.

and trains are allowed under certain conditions to travel in either direction on either track, even where the lines are doubled or quadrupled. On two occasions it occurred to the train in which I was travelling to be switched from the proper track to the wrong track without any halt, and without any formalities other than the handing to the driver or conductor of a train order, giving him instructions to travel on the wrong track, regardless of opposing trains. On both occasions we travelled in this way for several miles at a high rate of speed, there being, of course, no signals for the guidance or control of the train. Such a mode of working must be dangerous, as the least misunderstanding between the men who give and receive the train order, or any negligence on their part, must lead to an accident."

The conditions here described clearly show that American railway management is not such as would find favour in this country, where safety is always a first consideration. Similar observations were made by Mr. Wilson Worsdell, locomotive superintendent of the North-Eastern Railway, when on a visit to the United States. That official afterwards remarked at a lecture in Gateshead that American railways were not controlled by a Board of Trade, and were able to do such things as fly-shunting express trains—letting them run loose into a station, and bringing them up by means of the Westinghouse brake. Without such a free hand, he was convinced that traffic could not be worked in places like New York. Thus we see that, although American practice may be more elastic than our own, a very great deal is left to good luck. What is known as the "train-order" system, comprising no less than thirteen varieties, is used for regulating traffic on the single lines which form the bulk of American railroads. A similar system was tried years ago in Great Britain, but was abandoned as troublesome and dangerous. It may possibly be thought less disadvantageous on the other side of the Atlantic, but we are inclined to believe that its continued use is due to ignorance of the infinitely preferable "staff system" adopted on single lines in England. Colonel Yorke is clear in his own mind that the American train service could be conducted with greater punctuality, economy, and safety if the electric staff, or tablet, were introduced. On double lines in the United States, other classes of signals are employed, such as automatic signals, interlocking signals, telegraph signals, and block signals, a method of classification which sounds strange to our ears. Automatic signalling seems to exercise peculiar fascination over writers in the daily Press, and we have been told that its adoption would inevitably and immediately result in greater safety, increased economy and simplicity of operation, a reduction of expenses, and improved dividends. It is very inadvisable to place confidence in predictions of the kind. The fact is that automatic signalling is merely a labour-saving device, which does not necessarily introduce either greater safety or economy. As the Report justly says, "no doubt it eliminates the risks due to the mistakes of signalmen, but it introduces other risks peculiar to itself, due either to inefficient maintenance, to failures of the mechanism, to weather, and to accidents of various sorts." Further, it may be pointed out that the fundamental difference between automatic and "manual" signals is that the former merely acquaint the engine-driver with the fact that the line is clear for a short distance ahead, while the latter, having human intelligence behind them, convey direct orders to the driver telling him what he is to do. Moreover, the chief justification for a system of automatic signals is to enable more trains to be passed over a given length of line in a given time, and more trains necessarily involve increased risk of accident.

In America the block "sections" vary in length from about 700 yards to 1,300 yards, as it is found that the "track circuits" do not work efficiently on sections of greater length. At the commencement of each section, a "home" and a "distant" signal are erected for each line of rails. Consequently signals become exceedingly numerous, and Colonel Yorke says on this point that whereas the signals on American railroads have hitherto been too few, there is now a risk of their becoming too many. Considering the great length of modern passenger and goods trains, it must be clear that limitation of the length of sections necessarily means that the interval between the trains must be perilously diminished if full advantage is taken of the possibilities offered by the new system. With trains running at sixty miles an hour on block sections 1,000 yards long, the time interval between succeeding trains may be reduced to the minimum of thirty-four seconds, which would be dangerous and impracticable, and even at a speed of ten miles an hour the interval would not exceed 3 min. 24 sec. As trains would only run at so low a speed and would only be required to follow each other at very close intervals at terminal stations or other starting points, it is difficult to see the advantage of excessively short sections along the whole length of a railway where trains of varying speed are travelling along the same lines. In addition it should be borne in mind that the main lines in England are by no means overcrowded, that condition being practically limited to the Metropolitan district and similar districts in the vicinity of great centres of population and industry. On the score of expense, it may be thought that automatic signalling, if improved so that the sections could be made of suitable length, would conduce to ultimate saving. But the cost of installing a system of automatic apparatus is considerable, involving the erection of power plant for operating the signals, the laying of conduits for the entire length of the line, the provision of means for controlling the power, and the erection of signals. Hence a very large saving in wages and a largely increased capacity for traffic must be reasonably ensured to make the outlay justifiable. The considerations here mentioned tend to discountenance the hasty conclusion that automatic signalling must be a splendid system simply because it is American. Still, such signals may be found valuable, and it is satisfactory to find that one or two of our leading railway companies are at the present time investigating the whole subject. The London and South-Western Company have already equipped a section of line near Andover with automatic signals, and experiments are in progress on the North-Eastern Railway. These two examples show that our railway managers are quite alive to the necessity for adopting the most modern appliances, and the results of the trials will be of value in throwing light upon the applicability of such signalling to British railways.

Much has been written about the long freight cars used in America, and British railway authorities have been freely blamed for not adopting similar vehicles. As a matter of fact, there are reasons why waggons of great length cannot be generally used in this country. Sidings, goods sheds, weigh-bridges, turntables, coal tips, and other auxiliaries are usually unsuitable for waggons of the length employed in America. It may be suggested that the owners should immediately proceed to "scrap" all existing works and appliances, and to re-equip their systems on the American plan. To say nothing of the different conditions of trade, the cost of such a reorganisation would be stupendous, and in the opinion of Colonel Yorke it is uncertain whether, after all this vast expenditure had been incurred and the whole trade of the country had been disorganised during the transition period, the saving in handling traffic would pay the interest on the outlay. He thinks the four-wheeled waggon will probably remain the standard type of the country, and that economy is to be looked for by improving the design of such waggons and in increasing their carrying capacity in relation to tare. In this respect again, we find some leading lines are already moving ahead. Both the London and North-Western and the Great Western companies have lately built four-wheeled waggons having a capacity of 20 tons and a tare of about 8 tons, thus giving the same proportion of paying load to dead load which is afforded by the much advocated American truck of 50 tons capacity. The North-Eastern Railway Company are also introducing much larger trucks than have been previously employed. One type adopted is that of the Sheffield and Twinberrow model, built of steel, with a capacity of 32 tons and a tare of 13 tons. Another type, built of wood, and intended for the conveyance of coal, has a capacity of 15 tons and a tare of 7 tons. Both of these are "hopper" waggons, the former having two hoppers worked by a winch, and the latter having four hoppers. Such a departure from previous practice considerably affects ironmasters in the Cleveland district, as it will necessitate alterations to hoists and lifts at the blast furnaces. Some of the ironmasters take the position that the larger trucks are principally for the benefit of the railway company, who should therefore bear part of the expense involved in structural alterations at ironworks. Here is another difficulty in the way of any sweeping alteration in the goods system of the country.

Finally, we have the complication of private ownership, and it is difficult to see how private owners of waggons could be compelled to do away with existing trucks at immense cost, unless the taxpayer would consent to take the burden upon his already overladen shoulders. The "scrapping" theory may be glibly advocated in lectures and newspaper articles, but in matters of the kind reform must come by gradual development rather than by rude volcanic upheaval.

On the score of couplings and brakes, it does not appear that we should be wise in copying American practice, for Colonel Yorke regards the coupling methods he saw as anything but perfect; while on the Pennsylvania railroad, where hand brakes are used on numerous coal and goods trains, he found the brakesmen were obliged to run

about on the roofs of the cars while the trains were running down the Horse Shoe decline, a practice we are not surprised to find described as "highly dangerous and a fruitful cause of accident to the men." A reason assigned for the non-use of air-brakes on such inclines in America is that the re-charging of the air reservoirs may release all the brakes on the train. Some attempt has been made to overcome the difficulty by the use of retaining valves, but, unfortunately, the handles for operating the valves are always fixed on the roofs of the cars, so that the trainmen are still obliged to climb upon the roofs. As bridges over railways are growing in number, the dangers of railwaymen are proportionately increasing, and "warning ropes" are now hung across the line at each side of a bridge, the idea being that when a man has been struck by a dangling rope-end he will climb down to a place of safety. The ridiculous position of the valve-handles and the childish crudity of the so-called "safeguard" do not seem worthy of the reputation which our American friends have justly acquired for ingenuity. The law does not compel the use of air-brakes on all the cars of a goods-train, and the partial employment of the brake is found in practice to be a cause of accidents. With regard to economy of operation, Colonel Yorke says that "when it is remembered that some of the large American engines require three men on the footplate, and that the train crew consists of a conductor and two, three, or four brakesmen, it may be questioned whether the economies claimed for the American methods are as great as is sometimes hastily assumed."

Enormous sums of money are now being spent in the States, and very wisely, too, in the abolition of level crossings. In this respect British practice is being followed, as it will no doubt be in others, as conditions generally in the United States approach more closely to those prevailing here.

Before leaving the subject of steam railways we may refer to one or two notes in the diary of Colonel Yorke with regard to American railway stations. He says the accommodation is generally very complete and far superior to anything to be found in England. In addition to large waiting halls, well warmed and fitted with an ample number of seats, there are comfortable rooms for women containing all sorts of toilet requisites and conveniences, even cots for babies being provided. There are also smoking-rooms for men, and barbers' shops, besides baths and lavatories of a superior description. The restaurants are excellent, and the kitchen arrangements of the most modern type, and are supplied with every labour-saving appliance for cooking and washing up. These remarks appear to be inspired, at least in part, by a visit to the new station at Pittsburgh. Another station mentioned, belonging to a company representing five railways, is the Boston South Station. This is described as a remarkable structure, of which the most attractive features are the waiting halls, toilet-rooms, and restaurant. The main "car shed" covers an area of 506,430 sq. ft., and the whole of the building is built on piles, over which a concrete foundation has been laid. The roof appears to be singularly inappropriate and inartistic in design, being of a flat arched shape, with a covering of tarred felt. As may naturally be anticipated, the interior is dark, except when artificially lighted. Very complete arrangements are made for heating, and steam pipes are laid along all the valleys and gutters of the roof to thaw snow and to prevent any accumulation. In spite of the attractive features mentioned, we sincerely hope that British railway stations will never be modelled upon this remarkable example of American ingenuity. At St. Louis the station is also the property of an independent company representing several lines. We are not told whether daylight is excluded so religiously as at Boston, but the account before us mentions that the station is very large, the train shed containing thirty-two tracks, all available for the arrival and departure of trains. The various rooms for the use of passengers are said to be exceedingly comfortable, while the warming and lighting are most carefully attended to, so that it is quite a pleasure to wait for a train instead of a misery, as is so often the case elsewhere. But we are rather inclined to doubt whether the British public particularly want all the conveniences of a modern hotel in the terminus of a railway. We already have fairly satisfactory restaurants, and adequate lavatory accommodation. Waiting-rooms are comparatively little used, as people seldom arrive at a starting point until very near the departure of a train. Babies' cots, barbers' shops, and bathrooms are clearly superfluous in this country, whatever they may be in the United States. Of course, the case is somewhat different at provincial junctions, where long waits have sometimes to be made, and in such places there ought to be much greater provision for the comfort of unoffending passengers than exists at present.

The second part of Colonel Yorke's Report, dealing with surface lines, subways, and elevated railways, is of particular interest to Londoners. In the opening paragraph we find the statement that grooved girder-rails —as invariably used in England—are now being universally adopted for lines in the public streets, in place of the "step" rails formerly employed. Here is another instance showing that Americans are quite ready on occasion to follow our good example. The change is being made because the old-fashioned rails proved to be a serious hindrance to vehicular traffic, but so far as we are aware it was unaccompanied by any cries of "Wake up, America!" from excitable journalists. The fact is that American newspapers are free from that self-abasing spirit so prevalent here, and if any excitement is manifested, it takes the form of "booming" something American, and not of running it down. As a rule street railways are electrically equipped on the overhead trolley system, but in New York and Washington the conduit system with centre slot is used, there being objections to the overhead system in the streets of those cities. It seems to us that there are similar objections in all streets. The conduit system may have its disadvantages, but these ought to be surmounted by some of our electrical experts, so that the tramway of the future need not necessarily carry with it the disfigurement of public thoroughfares, and danger to the lives and limbs of those who are entitled to make use of them. From this point of view, the working of the County Council electric lines in the South of London will be watched with considerable interest. Similar interest will attach to the forthcoming Report, by the Tramway Committee of the Wolverhampton Town Council, upon the surface contact system which has been in operation in the borough since February, 1902.

Perhaps the most interesting and instructive study presented in Colonel Yorke's Report is that relating to electric inter-urban railways, which are exceedingly numerous in the United States. Every city has a network of such lines, radiating in every direction, in addition to mere extensions of street tramways. Many inter-urban railways were originally built for steam locomotives, and some of them were formerly branches of the ordinary steam railroads which have recently been equipped for electric traction. Colonel Yorke instances five branch lines, built for steam trains, the first of which was electrically equipped in 1895. According to the most recent returns, the following figures represent the passengers carried by the two systems of traction:—Steam, 1,038,223; electricity, 2,290,971. This large increase is attributed to the greater frequency of the service, the reduction in fares, and the increase in speed. Several notes in the Report refer to the excellent services afforded by inter-urban lines of the kind. Some of our own railway companies are fully aware of the advantages of the system in operating branch lines, and three companies are already arranging for the conversion of certain parts of their systems. In this particular department of railway work we shall, no doubt, see very great developments during the next few years, not only in the electric equipment of existing branch lines, but also in the construction of new railways between town and town in all parts of the country. It is found in the United States that electric high-speed inter-urban lines invariably render population more numerous in their vicinity, land values are enhanced, industrial enterprise is stimulated, and the convenience of the public is secured by a frequent and economical service of cars. It appears from the Report that competition is keen where steam roads exist side by side with electric lines, but although the steam roads must lose a certain amount of traffic, the increased prosperity of the districts served ultimately brings in more business as a compensation. As a general rule, it is probably true that the electric railways will act as feeders for the through and long-distance traffic of the steam roads.

In some minor respects the Report made by Colonel Yorke is a little disappointing, but on the whole it is a document of much interest and great practical value. We may learn from it that American railway practice is not suitable for indiscriminate adoption in this country, and yet that many hints may usefully be taken from it. Above all things, British railway arrangements must be exactly fitted to the needs of passenger and, what is equally important, of goods traffic. Steam railroads are just about to enter upon a period in which severe competition will be felt from electric tramways and railways. There will necessarily have to be some modification of policy; the older organisations must in future look to long-distance traffic to a considerable extent, leaving short journeys and urban traffic to their competitors. The suburban traffic of London, and in a smaller degree of other great cities, will be taken in a measure from the steam

railways, and it may be hoped that when relieved from the almost intolerable burden of such service, they will find adequate remuneration in what remains to be worked and developed to a state of perfection that is under present circumstances unattainable.

CHRISTIAN ARCHÆOLOGY IN ROME.

THE Italian Government has taken the lead in the marvellous discoveries made during the last few years, and Signor Boni, the Government Director of Excavations, is now publishing the results. The Pontifical Commission of Archæology has also attempted explorations in the vast zone of cemeteries surrounding Rome. De Rossi was the first to organise methodically these discoveries in the course of the last century. It was thus that the catacombs of Pricilla on the Salarian Way have furnished documents of the first century of Christianity with their records of the early Popes.

Lately, not far from the Appian Way and the catacomb of St. Calixtus, has been found the family crypt of Pope St. Damasus (366-384 A.D.), whose history is so intimately connected with the catacombs. This Pope occupied himself especially in composing a series of metrical inscriptions which were engraved by a certain Dionysius Philocalus in a special character. These inscriptions were placed on the tombs of Martyrs and Pontiffs. Traditionally Damasus was known to have prepared for himself and his family a tomb in proximity to the catacomb of St. Calixtus, but its actual position was unknown. It has now been found near the Via Appia, in a cemetery called "Balbina." This crypt is ornamented with frescoes. It is supposed that here St. Damasus was buried with his mother, to judge from the fragments of inscriptions found on the spot. This Pope saw the definite triumph of Christianity; for during his reign Theodosius published the famous decree abolishing all Pagan cults in Rome.

The excavations are being continued with vigour in this burial region, and it seems probable that many fresh discoveries will be made before long.

The Christian antiquities of the Roman Forum which have been brought to light during the last few years constitute a remarkable collection, illustrating the earliest history of Christianity. It is noticeable that all these remains appear to belong to what may be called the catacomb period of Roman history. The two important churches of S. Andrea and S. Maria Antiqua, built out of remains of older buildings, must have been of great importance in early Christian days. S. Andrea (the ancient *curia* of Classic times), although much altered at a later period, possessed an imposing atrium at the west end, with a large heptagonal font or holy-water stoup in its centre, about 10 ft. in diameter. Almost all traces of this atrium have disappeared, with the exception of the plan of the font; the remainder of the area is a confused mass of foundations of different epochs. The west front of this ancient church presents the peculiar feature, which seems to have been common in buildings of that period, of *loculi* cut into its brick walls. All these evidences of a remote antiquity remain much as they were discovered about two years ago, and in one of the *loculi* even the bones of the defunct have been left *in situ*. Within the last few weeks a singular crypt-like tomb has been discovered, constructed within the space beneath the principal entrance of the ancient *curia*. Within it still stands a plain marble sarcophagus of Christian times.

The church of S. Maria Antiqua or S. Silvestro del Lago, on the opposite side of the Forum, close to the House of the Vestals, was laid bare about two years ago by the removal of the seventeenth-century church of S. Maria Liberatrice, which was built over it, and which seems to have completely obscured its existence until quite recently. The history of this venerable building is unknown, and unfortunately the well-meant efforts to "restore" it to a condition which would be generally intelligible have resulted in rendering it less interesting to the archæological student. We have recently referred to it at some length in a review of the publication of the British School at Rome;* but may add a few particulars from personal inspection. The entrance, as shown on Mr. Rushforth's plan reproduced on page 352 *ante*, was through an immense atrium at the east end—an atrium appropriated from more ancient constructions. To the east of the atrium is a curious small building, supposed to have served as a smaller basilica or consistory of the Bishop. This smaller building has traces of a singular arrangement of *cancelli* at its entrance, but its apse, to judge by the wall-paintings and some traces in the floor, has also at some time served the use of a baptistry. In the main church there are evidences of early reconstruction. The idea suggests itself that in course of time the more ancient position of the altar at the west end was abandoned for the later chancel constructed towards the east.

S. Maria Antiqua must have been originally one of those early churches constituted within the precincts of a Roman palace, and as such there is a legend that it formed part of the Palace of Caligula and the adjacent Temple of Augustus. The remains as we now see them are chiefly interesting on account of the well-preserved series of wall paintings (probably of the seventh century) which cover the walls, and although of the rudest description, are imposing by their quantity. The smaller building, referred to as the Consistory or "Episcopium," is also completely surrounded with the same style of decoration. It is a pity that this very singular and complete example of early painting cannot be better protected than at present. A number of reed mats are hung in front of the fresco to ward off rain, but every gust of wind tends to injure them by causing the mats to scratch and rub the surfaces.

The alterations to the main church of a later period, already referred to, have also been covered with the same kind of painting. It is, consequently, probable that these alterations date from about the seventh century.

Everywhere in S. Maria Antiqua, as in S. Andrea, there are instances of the wall-sepultures, evidently made in imitation of the *loculi* of the catacombs. At the east side of the atrium are several examples in perfect preservation, with the bodies still within them. A large sepulchral chapel, or mausoleum, on this side of the church is lined with them, and, in addition, there are several terra-cotta coffins ranged round the sides, which seem still to be filled with undisturbed remains. The lids of these coffins were formed by the paving of the chapel.

In all that has been done of recent years much praise is due to the energetic officials who have succeeded in unearthing so much of public interest. In such a matter it is very difficult to please every one. To the archæological student things appear uninteresting when they are treated as a profitable show for tourists (even tourists of an intelligent kind), and when for this purpose so much "restored ruin" meets the eye. But such a condition of affairs is inevitable, and we have much to be thankful for that the "Christian Antiquities of the Roman Forum" were not discovered fifty years ago, when they would certainly have shared the fate of the "Christian Antiquities" of the Acropolis of Athens or many another venerable site. The "restoration" of these ruins, as ruins, affords an interesting evidence of the singular change which has come over the archæological world, and of the popular interest now taken in such Christian Antiquities, in spite of their occupying the space of, and being constructed out of, the remains of classic monuments.

* See *Builder*, April 4; first article.

NOTES.

"Owners" under the Public Health Act.

THE case of Driscoll *v.* Battersea Borough Council recently heard by a Divisional Court decided a difficult point under Section 250 of the Public Health Act, 1855. Driscoll, the appellant, having been summoned by the Borough Council for contribution towards the expenses of paving a new street, alleged he was not the "owner" of the premises within the meaning of the above Section, which defines the owner of premises as the person for the time being receiving the rack rent, or who would receive it either as owner, trustee, or agent, if the premises were let at a rack rent. The appellant held the land from the owner of the freehold under a building agreement which gave him the right to erect thirty-two houses upon it, and also upon the completion of each house to call for a lease of it for ninety-nine years, and it was provided that until leases had been granted in respect of all the flats he was to pay the freeholder a sum of 200*l.* per annum. The agreement was expressly stated not to be a demise, and the freeholder had power to distrain for any part of the annual payment of 200*l.* which might be in arrear. On these facts the Court held that the freeholder by the terms of the agreement retained the ownership in the land and was in law the person contemplated by the section, *i.e.*, the person entitled to receive the rack rent, any rights Driscoll, the appellant, might have being solely the creation of contract.

The Right to Light—Another Decision.

THE case of Easton *v.* Isted, which is reported in the current number of the Law Reports, is a decision of Mr. Justice Joyce and of the Court of Appeal. It is interesting, not for the statement of any new principle on the subject, but as a useful example of the application of the existing law. In 1873 Mr. Easton erected a conservatory with a glazed roof sloping down to the vertical side of the conservatory. This side was glazed, and had sashes so that it could be opened. When this building was erected the

plaintiff a yeoman of the wardrobe and was plaintiff enough consideration the plaintiff presented ancient was aside became display and entitled the meaning that presented could for glazing window not is Coutts But be aside not words above him from and respect against of such house mining pipes house one several contrary the blocks opposite the drawn the of but occasion with with Mr one from

hold attempt consideration of the power mine Rose room of

plaintiff signed an agreement to pay a shilling a year "as an acknowledgment for allowing the windows in my conservatory to open on to and overlook the defendant's property which was immediately adjoining that of the plaintiff." So far the plaintiff had clearly enough only an enjoyment of light by consent or agreement within the meaning of the Prescription Act, and so was gaining no prescriptive right over the defendant's ancient tenement. In 1888 the conservatory was converted into a passage, the glazed side was bricked up, and the glazed roof became a skylight. In 1901, the defendant disputed the right to the light of the skylight and consequently the plaintiff claimed to be entitled to an injunction on the ground that the glass roof was not a window within the meaning of the agreement, and, therefore, that as regarded the roof he had a prescriptive right to the light—for, argued counsel, a window is an opening in a wall for the admission of light and air, and a glazed roof could not be said to be a window. But, said Mr. Justice Joyce, a window is not less a window because it is not capable of being opened, nor because it is not fixed in a vertical placing. The Court of Appeal were of the same opinion. But the true rule by which such cases must be decided appears to us to be the consideration of the intention of the parties, not a mere technical construction of a single word, for it would have been obviously absurd for the defendant to have guarded himself against the growth of a right to light from the side of his neighbour's building, and to have allowed him to obtain it in respect of the top.

Drain or Sewer?

THE vexed question of what constitutes a sewer as distinguished from a drain was again before the Court of Appeal in the case of Silles *v.* Fulham Borough Council. Two houses built in one block had a gutter running under the eaves which drained into a pipe down which the rain-water from both houses and the bath water and slops from one house were conducted into the main sewer. The plaintiff, the owner of the houses, contended that this constituted the pipe a sewer repairable by the Borough Council, and the Court of Appeal upheld this view. When a block of buildings is drained by a combined operation the conduit pipe may come within the definition of a "drain," but when two drains serve two houses and run together they become a "sewer," even although one of the pipes does not conduct sewage matter but only rain water. We have on former occasions pointed out that the question as to whether the building is "one building" within the meaning of Section 250 of the Metropolis Management Act, 1855, or not, is one of fact to be determined by the Court of first instance.

Railway Hospitals.

ALONG the western and south-western trunk lines of the United States, where public hospital accommodation is only to be found at widely separated intervals, the railway companies have established a regular system of permanent hospitals. Other railways possess hospital and relief services, and in many of the buildings belonging to the Railway Young Men's Christian Association rooms have been equipped for the treatment of injured railway servants. In the eastern States, permanent railway hospitals are not so much a necessity as in more outlying regions, but hospital cars are now being used by the leading companies. Cars of this kind are divided into three compartments: an operating room, a small ward for the slightly injured, and a larger ward for those seriously injured. The operating room contains a well-appointed operating-table, sterilising apparatus, and an oxygen cylinder. As more than 3,000 persons are killed annually, and over 40,000 persons are injured every year on American railways, there can be no doubt that facilities of the kind mentioned are absolutely necessary. The numbers of killed and wounded on British railways are much smaller, partly because the total mileage is less, and partly because of the greater care exercised. Nevertheless, the average annual sacrifice is about 630 lives, and the number of persons injured averages nearly 6,000 per annum. It is therefore clear that ample need exists on all the chief railway lines for suitably equipped hospital cars, which could be dispatched at short notice to the scene of an accident, and which would be generally available for dealing promptly with the numerous cases of injury constantly occurring during shunting operations.

Fire Escapes.

No other class of life-saving appliance has been more improved of late years than ladders intended for the rescue of persons imprisoned within burning buildings. It must be admitted, however, that the most approved forms of such apparatus are not readily adopted by the authorities who have the control of fire brigades in this country. Our contemporary, the *Scientific American*, describes a new telescopic ladder operated by compressed air, and which deserves serious consideration. When used for rescuing a person on the roof, or on one of the upper floors of a blazing building, the ladder is instantly shot out, so that the upper extremity is close to the imperilled person, who can step upon the top round. The ladder then suddenly collapses, the tubes telescoping in rapid succession, and brings the rescued occupant safely to the ground. As a general rule, the telescopic ladder is worked under an air pressure of 300 lbs. per square inch, the air reservoir being situated in the centre of the carriage bearing the ladder. An auxiliary air reservoir is frequently provided, containing air at the lower pressure of 100 lbs. per square inch, for the supply of power for swinging the ladder from one side of the street to the other, so that buildings on both sides of a thoroughfare may be served without delay. The carriage weighs about 2 tons, its construction being heavy and massive to prevent the possibility of overbalancing. Ladders of this type may be extended to the height of 85 ft. in the brief space of twenty-five seconds, and as the apparatus is strong enough to support a dozen men, rescuing operations can be conducted with great rapidity. Every one in the Metropolis would be pleased if the London County Council could spare a few thousands, from the sums annually wasted in promoting impossible Bills in Parliament, for the purchase of the most improved types of fire-fighting apparatus, among which the ladder described occupies a prominent position.

Surface Contact Railways.

THE Report on the first year's working of the Wolverhampton surface-contact electric tramway, already referred to briefly in our first article, is deserving of study by every one interested in tramways. The Lorain system is used, and the cars pick up the current by means of a collecting skate from studs placed between the rails, at distances of 10 ft. apart, which are made "alive" when the car is over them by means of the powerful magnets it carries. Now opponents of surface-contact systems maintain that it is impossible to arrange the stud so that it can never be left "alive" after the car has passed over it. From Mr. Shawfield's Report we find that on no less than 109 cases during the year a stud had been left "alive," although on only five of these occasions had shocks been received. It is interesting to note in this connexion that the wear of the paving round the contact boxes was much less than was anticipated, owing largely "to the fact that the tracks are avoided to some extent by the general traffic in the streets." Mr. Shawfield concludes that although in his opinion it is impossible to make the system absolutely safe, and that there is a greater liability to shock than with the overhead trolley, yet "there is distinctly less risk of serious injury to users of the streets." The consumption of current has been about 30 per cent. greater than it would have been with overhead wires. The wear of the collecting plates, which cover the studs and from which the current is picked up by the skate, has been unsatisfactory. The average life works out to only two years, and hence the cost for renewals will be much heavier than for renewing trolley wheels. Another point that impressed us unfavourably was that there were 1,090 soldered and insulated cable joints per mile of track, and although the cables are laid in the solid system in bitumen we expect that there will be trouble with the insulation resistance after some years' working. The Wolverhampton tramways prove, however, that it is possible to have a practical surface contact system at an expense not very much greater than the objectionable overhead system.

The Microscopic Structure of Metals.

THE microscopic examination of metals is of considerable utility in various directions. Chemical analysis will not always reveal the causes of defects in metallic structures, and in such cases the microscope is an invaluable aid. Failures of plates, shafts, and tubes can often be explained by information thereby obtained, and explosions of steam-pipes have been shown to result from the disintegration of brazing through the oxidation of zinc therein contained. But it must not be supposed that the usefulness of this method of research will be limited to the explanation of mischief accomplished, for it will enable engineers and metallurgists to find means of remedying those mysterious faults at present occurring in steel, copper, and other metals, and in different alloys. Much information as to the crystalline structure of metals has been obtained already, and it is now known that glass really has such a structure, although it is commonly supposed to be non-crystalline. Microscopic examination shows that different forms of brass and bronze

sometimes consists of at least two qualities of alloy, one richer in zinc than the other. Under such conditions, corrosive influences may attack one of the constituents leaving the other, or others, unaffected, the mixture appearing to form a series of minute galvanic batteries, the action of which would be to accelerate corrosive effect. There is every reason to believe that the microscopic researches now being carried out will be fully repaid by the additional security and reliability of work in which metals are employed.

The Mersey "Transbordeur" Bridge.

A "TRANSBORDEUR" bridge now in course of construction at Runcorn is intended to provide means of communication across the Mersey and the Manchester Ship Canal. The general features of construction are similar to those of the proposed structure at Newport, Mon., and need not again be described. In the present case the towers rise to a height of 190 ft. above high-water level, and rest on caissons. The stiffening girders suspended from the main cables are to be at an elevation of 82 ft. above high-water level, and the bottom of the travelling cage, or car, will be about 12 ft. above the same level. About 300 passengers, and four two-horse waggons, can be accommodated in the car at one time, and the trip across the river will be performed in 2¼ minutes, which, allowing for loading and unloading, will permit about nine or ten trips an hour to be made. One of the main towers is on land, and the other is in the waterway at a short distance from the river bank, being reached by means of an approach viaduct. When completed, this bridge will possess a longer span than any bridge for road traffic in the United Kingdom, the clear span being 1,000 ft. A number of similar structures have been erected on the Continent, where they appear to give general satisfaction. The idea is certainly an excellent one for adoption in places where the banks of a river or estuary are little higher than the level of the water.

Prittlewell and St. Mary's Priory, Essex.

IN the course of next month will be offered for sale, at the Mart, the St. Mary's Priory Estate, near Southend-on-Sea, covering forty acres, which include a well-timbered park and a fine avenue of elms. The mansion-house embodies some remains of the Priory, founded *temp.* Henry II. by Sir Robert de Essex, son of Sweyn, for Cluniac monks who were subordinated to the great convent at Lewes; the revenues at the Suppression are computed by Speed as being nearly 195*l.* yearly. In 1537 the Priory and the Manor of Priors were granted to Sir Thomas Audley, who conveyed them to Lord Riche and his son. The property vested in the Earls of Warwick, of that house, until about 1675, when it passed to Daniel, second Earl of Nottingham and sixth Earl of Winchilsea, who married, as his first wife, Lady Essex Riche, daughter and co-heiress of Robert, Earl of Warwick. The Earl of Winchilsea and Nottingham sold the property to Daniel Scratton, to whose descendants it has since belonged. Close by stands the ancient church of St. Mary the Virgin, one of the most interesting in the county, having a fine, stately, pinnacled, Perpendicular tower, which forms a conspicuous landmark. The fabric presents vestiges of late eleventh-century work. During the restoration carried out by Ewan Christian in 1872 it was found that the three western arches dividing the nave from the aisles, of the twelfth century period, had been cut through a much older wall that contained traces of Early Norman windows. A blocked-up arch in the north wall of the chancel was composed, in part, of Roman bricks. Some glass, from a church in Rouen, in the memorial window to the late Sir Arthur Neave, Bart. [(1877) is attributed to Albert Dürer.

The Society of Water-Colours.

THE hundred and thirty-second exhibition of the Society of Painters in Water-colours thoroughly maintains the traditional character of these exhibitions, as being on the whole the most satisfying in London — those in which the proportion of good work is the largest. We may mention at the outset two landscapes which are really grand in style—Mr. Little's "From Criffel to Allonby" (13), with a colour that reminds one of Titian, and Mr. Eyre Walker's "The Passing of the Stormclouds" (78) over a forest country. Sir E. Waterlow's "A Summer Morning" (2) and "The Ravine of the Dart" (108), less grand in style, are delightful for their freedom of touch in a pure water-colour manner. Among others of the more important landscapes are Mr. Cuthbert Rigby's "Among the Lonely Hills" (24), Mr. Thorne Waite's powerful though perhaps a little too emphatic sunset effect "Warkworth Castle" (79); Mr. Colin B. Philip's "Low Tide — a Bay of Loch Maddy" (173), a different subject from his usual built-up hill scenes—the levels of an estuary, with the hills only seen in silhouettes in the extreme distance; Mr. R. W. Allan's "End of a Summer Storm" (177) on the coast, with a fine and unusual treatment of sea; and Mr. Thorne Waite's "The Miller and his Horses" (195), noteworthy for its admirable composition—a picture that is in unity with itself. Mr. Albert Goodwin exhibits several drawings with very different aims; a study of desolation in "The Overthrown Cities" (141); studies—most interesting these—of morning and evening effects in Venice; an architectural study of "Canterbury Cathedral" (214), faithful in form but (as usual) too much refined away in tone and colour—Canterbury Cathedral as a vignette, one may say; and a little gem of delicate work under the title "New Sarum, from the Old" (221). Mr. Arthur Hopkins, a figure painter rather devoid of sentiment, has nevertheless made a great success with his nude study of a mermaid—"A Fantasy of the Deep" (177) — not a fish-tailed mermaid, but one of human form and comeliness, and an admirable piece of drawing. Mr. Walter West, one of the latest additions to the Society's ranks, has perhaps not quite repeated his great success of last year; but his "Firelight" (218) is a remarkable little picture, and the two others (116, 140) are well worth study, as the work of an artist of individual aims and with a handling of his own. Mrs. Allingham is again prosecuting Venetian subjects as a change from the delightful English scenes which we have known and loved for so long, and in "A Fruit Stall, Venice," (110) she has found a subject out of which more can be made than in her two Venice pictures of last year. Architectural subjects are numerous and interesting; the best being those of Mr. Reginald Barratt, whose "Horses of St. Mark's" (122) is an admirable and most careful study of those historic animals in their present weather-worn condition. "The Shadow of the Campanile" (103) is another good example; in the interior of "Kaloon Mosque" (128) the perspective of the capital is awkward; the point of view is too close, it could only appear right with the eye at a special point near the lower part of the picture, and (as usual in such cases) it is hung so low that it is impossible to see it from that point. His "Green Ship, Venice" (14) is an interesting colour study. Several of Mr. Rooke's architectural subjects are to be seen, all well handled; and Mr. Paterson, though his manner is far too woolly, has made an effect with "The Tower, La Laguna" (157). There are many other drawings we should like to mention did space permit. We hope, however, that the Society will keep clear of introducing the element of modern eccentricity into its exhibitions. There has not been much of it so far, but there are some things in the present exhibition which would be much better out of it, and are not in keeping with its generally high level.

The Rowland Club.

THIS is the title taken by a small group of artists who have opened a very interesting exhibition (entrance free) at Clifford's Inn. The most prominent exhibitors are Mr. Selwyn Image, Mr. Holroyd, Mr. Brangwyn, and (in furniture) Mr. Mackmurdo. One object of the Society is to offer small works which may be within the means of those who wish to purchase original works of art, but who cannot afford the price of finished works in painting and sculpture. This therefore, except as regards the furniture, is essentially an exhibition of sketches and studies. The landscape sketches by Mr. Selwyn Image, of slight execution and a style recalling the eighteenth century, are of great charm of composition and feeling; and in a very different way Mr. Brangwyn's white and brown etchings, "Assisi" especially, are very powerful and original. Mr. Frank Short exhibits a number of slight water-colour sketches which are very interesting, as they look so like the elements of some of his landscape etchings translated into water-colour—the same kind of composition and the same prevalence of large untouched spaces and concentrated darks. Some sculpture sketches, and one or two heads which are more than sketches, by Mr. Stirling Lee, are among the exhibits. Mr. Mackmurdo's furniture, of which there is a good deal, is not what we should call very interesting in design, and yet it is highly commendable in the sense that it is, and is evidently intended to be, a practical protest against the spirit of eccentricity in furniture design which is too prevalent at the Arts and Crafts; it is all soberly-designed work on classic lines, and in perfectly good taste; our only complaint is that, with all its good quality, it just falls short of being interesting. But we would rather have this than a studied eccentricity.

Clifford's Inn.

THE *Burlington Magazine* for this month contains an interesting historical article on Clifford's Inn, written by Mr. Philip Norman, F.S.A., and illustrated with sketches by Mr.

F. L. Griggs. The ultimate object of the article is to draw public attention to the value and interest of Clifford's Inn, which it is now proposed to sell and demolish for the purpose of erecting new buildings on its site. The ostensible excuse is that the proceeds are to go towards "legal education," an excuse the futility of which was pointed out in a sensible letter by Mr. St. John Hankin in the *Times* of the 21st inst. As it is apparently useless to appeal to the architectural and archæological perceptions of those concerned, Mr. Norman in his article urges that tall new buildings erected there would be a danger and a deprivation of light to the Record Office; a consideration which may very well be taken into account. But the prominent and urgent reason for opposing the scheme is that this is a most interesting and picturesque corner of Old London, and the Hall itself a charming old room, frequently in use for the meetings of the Art Workers' Guild and for other meetings, exhibitions, &c. It cannot therefore be said to be useless, and this continual and persistent destruction of picturesque remnants of Old London, in pursuit of mere money, is step by step depriving us of what constitutes an important part of the value and interest of London, which money can neither purchase nor replace.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday evening at No. 9, Conduit-street, W., the President, Mr. Aston Webb, A.R.A., in the chair.

Deceased Members.

The decease of the following members was announced:—Mr. E. Birchall, elected an Associate in 1863 and a Fellow in 1871; Mr. Francis Edwards, elected an Associate in 1857 and a Fellow in 1861; Mr. Young Bolton, elected an Associate in 1882; Mr. Richard Phillip Day, elected an Associate in 1882; and Colonel John Davis, elected a hon. associate in 1887.

New Members.

It was announced by the Secretary that under the proviso of By-law 9, Mr. John Woodfall, President of the Liverpool Society, and Mr. Jos. Swarbrick, of Manchester, had been elected members.

Four Modern Hospitals.

A paper was then read by Mr. E. T. Hall on "Four Modern Hospitals," of which the following is an abstract:—

Mr. Hall said that he purposed to deal not with hospitals in general, but with concrete examples on which he had personally laboured. These were representative of four types—viz.: (1) Hospitals for scarlet fever, diphtheria, and enteric diseases, which are generally grouped under one staff; (2) those for smallpox; (3) sanatoria for tuberculosis or consumption; (4) general hospitals. The examples the lecturer brought forward illustrated one of each kind—viz.: (1) the City of Leeds Fever Hospital, at Seacroft; (2) the City of Leeds Smallpox Hospital, at Killingbeck; (3) the Sanatorium at Frimley, in Surrey, for the Brompton Consumption Hospital; (4) the Camberwell Infirmary.

Before dealing with his examples, the lecturer made some general observations on each type of hospital, discussing questions of site, plan, location, medical treatment, numbers to be accommodated, &c. Consumptive sanatoria the lecturer considered justified, if only as schools of domestic and personal hygiene. Patients may or may not be healed entirely of their disease, but they are taught the value of cleanliness, of exercise, of fresh air, of regular habits, of order and self-respecting discipline, and they go back as missionaries to their families and friends. As regards site, all kinds of infectious hospitals should be away from a densely built neighbourhood. For a general hospital in town, the site should be as open as possible, and preferably surrounded by roads which form wind channels to change the air. Low-lying land with a shallow gravel subsoil should be avoided. Public smallpox hospitals are required to have a quarter-mile zone around them—that is to say, the land forming the hospital estate must be 130 to 160 acres in extent, and in the heart of this, shut in by a ring fence, must be the portion reserved for patients. For mixed fever hospitals a zone is required to protect not only the public, but also those suffering from different diseases. But where the site is large enough the isolation of the pavilions or ward units should be considerable for the comfort and pleasure of the sick. Prospect, sunlight, trees, and gardens are all aids to recovery. No hospital on a rural site should be more than two stories in height. In all the best modern examples of hospitals, the main wards are placed with their axes north and south, when this is practicable, with windows on both sides and at the ends. Thus every bed and every wall gets all the sunlight there is during some part of the day. Double wards—that is, wards with a central wall and rows of beds on each side of it—should always be avoided. For consumptive sanatoria, as distinct from hospitals, large wards are not adopted; the ideal is a single room for each patient, with a southerly aspect, in a building not more than two stories in height. On a city site, where relatively high buildings are a necessity, three or more stories are suitable; and lifts and thoroughly aerated staircases for access and for fire escape must be provided.

Referring to the ordinary layman's idea that a hospital is but a single building, the lecturer said that a fever hospital is almost a village, with thirty to fifty separate buildings, and with a staff of three hundred or more persons. In one of his hospitals there were within the curtilage six miles of drains, twenty-nine miles of water and steam pipes, and forty-two miles of electric wire. At Seacroft there were eight to nine miles of drains.

The City of Leeds Fever Hospital, at Seacroft, is about three miles from the centre of the city. The site was formerly a beautiful park, and the trees have been kept wherever possible. The area is 41 acres, and from one end of the building to the other is about a quarter of a mile. The hospital consists of forty-two separate buildings. It is presided over by a medical superintendent with three medical assistants, a lady superintendent or matron with her assistants, and a staff of 102 nurses and seventy-two female servants. The male officers and servants number about thirty-eight. Accommodation is normally provided for 452 patients, but in cases of emergency a much larger number can be received. Attached to the hospital is a quarantine station of many cottages, to which infected families are removed until danger is past. The administrative buildings consist of: (1) The offices, with residence for the matron, for the assistant medical officers, and for resident porters and others; (2) the nurses' home, containing 121 rooms; (3) the female servants' home, with eighty-four rooms; (4) dining-rooms for nurses and servants between the homes and the kitchen; (5) the hospital kitchen, steward's stores, dispensary, staff consultation room, sewing room, &c. A complete laboratory, with students' rooms, forms another building. To the east and west of this group, on the main covered way, are patients' admission rooms to the different parts of the hospital. Every part of the hospital is connected by glass-covered open ways, with subways beneath for steam, hot and cold water, and gas pipes, electric mains, &c. The hospital pavilions are grouped in pairs, with fuel store and nurses' lavatories common to both on the cross corridor. Beneath these staff offices is the heating chamber. Each pavilion is axially north and south, with windows on both sides and at the ends. It has an entrance hall with the duty room opening from it. To right and left are large wards, each containing fourteen beds, and opening from these are single-bed wards, all overlooked from the duty-room or ward kitchen. Each large ward has a wide balcony at the extreme end, flanked and sheltered by the towers, containing bathrooms, lavatories, and water-closets, and near these is an external flight of steps leading to the grounds. Beneath every pavilion is a paved open basement, about 5 ft. or 6 ft. high, forming an aerial disconnexion of the wards from the earth. In this all pipes and cables are placed, so that repairs can be done without coming inside the building. The smoke flues are also swept from beneath. The ward floors are of polished teak laid direct on the concrete. The walls are of cement, painted and varnished to match the faïence chimney-pieces. The heating is by passing fresh air over hot-water radiators at a calculated low velocity, so as always to be changing the atmosphere of the room, and this is done completely three times an hour. The extraction is by fire and aspirating flues. Heating, the lecturer considered, should never be done by pipes laid in channels with gratings over. These become receptacles for dust and filth of all kinds. The ventilation of the hospital was secured by natural, as opposed to artificial, means, such as that usually called the Plenum system. In the lecturer's judgment, the latter was a mistake in any hospital. The windows, consisting of a pair of sashes and a fanlight with glass spandrel cheeks, extend to the ceiling. Describing the sanitary fittings, the lecturer showed a drawing of a bed-pan sink designed by himself for hospital use. Its advantages are that it uses about half the water of any other; no water stands in any pipe when out of use; one flush not only feeds the rim, but spreads a palm-like wave which, entering the bed-pan handle, thoroughly cleans everything. The isolation pavilions, of which there are four, consist of wards of one, two, and four beds each, with nurses' rooms and special sanitary accessories for treating different diseases. In each of the diphtheria pavilions there is an operating room with side and top light. The block for severe operations contains an anæsthetic lobby, a theatre, and a sterilising room. The staff quarters have everything necessary for comfort. There is a large recreation-room, a writing-room, a library, a third sitting-room for probationers, a suite for the home sister, ample offices, and a separate bedroom for each nurse. The whole hospital is of fire-resisting construction. The hospital kitchen is a room 50 ft. long, with a large scullery attached. Close by is a large bakery, and there is a group of larders facing north and arranged with through currents of air. The steward's store is 60 ft. 6 in. by 25 ft. 7 in., with a gallery round. From this centre enclosed trolleys convey food and stores to all parts of the hospital. There are separate laundries for patients and staff. Near the entrance to both is the disinfecting house and the destructor. All unconsumed food and pieces are burnt. The engine-house will contain three large direct coupled dynamos to light both this hospital and the Killingbeck Hospital. The heating of both will be done from this centre. The exhaust steam from the various engines is collected and used for heating. In like manner is collected all the condensed water, all the cooling water from electric engines, &c., and this is filtered and pumped at 180 deg. into the economiser. In this way, when the engines are running, all the heating and hot-water supplies will be done for nothing, thus saving some hundreds of pounds a year. Describing the drainage and treatment of sewage, the lecturer drew attention to the sewage irrigation outfall, from which it is necessary to exclude typhoid germs, and showed drawings of an apparatus devised by himself for dealing with these germs. It consists of receiving tanks and boilers for alternate use. The typhoid sewage is received and boiled by steam, after which it passes to cooling beds, and thence to the outfall sewer.

Killingbeck Smallpox Hospital is situated on the top of a hill, with undulating country all around. The grounds proper are 12 acres in extent, but the total attached area is 140 acres. The hospital buildings proper are grouped together on the summit of the site, the offices and medical quarters being in the centre, the laundry and mortuary to the west, the discharge block to the east, all outside the hospital road. Entering in the centre, the nurses' and female servants' homes, respectively, are to the west; the kitchen and stores, dispensary, and serving-room to the south; the male servants' home to the east. Beyond, to the north, lie three large pavilions and two isolation blocks, while the admission block to these is at the junction of the covered way. The mortuary here has no visiting-room for friends to view their dead, but it has, under a peristyle, a plate-glass sarcophagus, into which the body, suitably dressed, is placed from the mortuary on a rolling bed. The visitor, standing in the open air, can thus see the dead, but cannot come into actual contact with the body. To enable the heating to be done from Seacroft,

as above mentioned, the highway had to be tunnelled, and a covered trench carried right up the hill. The hillside down which the drain had to come was very steep, so reasonable gradients were got by a series of weirs in the pipes.

The Frimley Sanatorium for the Brompton Consumption Hospital was next described. Here the author said he had tried to get away from the hospital, to suggest breeziness and health and the pleasant atmosphere of a large home. The institution consists of sixteen buildings. The patients' block is cross-shaped, with accommodation for eighty-eight patients in four two-storied radial pavilions, and for twelve in the centre where special cases may be under closer surveillance. Every patients' room faces S., S.S.E., or S.S.W. His first design was for putting the eighty-eight patients in single rooms ; but this was overruled. For the King's Sanatorium, however, his original plan was shown to his Majesty and to Sir Ernest Cassell, and the Committee came to the same conclusion as that he originally contemplated. As regards concentration, which in Germany was carried to an extreme, the lecturer said he had tried to find a mean. At Frimley they had 100 patients all within a radius of 195 ft. from the doctor's consulting room and matron's sitting-room, and yet every room has an open outlook ; all are away from noise and bustle, all have the greatest amount of sun, and all are sheltered. Another advantage of the plan was that ample classification could be got. They could have units of twenty-five males or females, with their separate group of closets, bathrooms, and lavatories, or they could arrange convalescents by themselves or make other divisions of patients in units of eleven. There was but one dayroom on each floor. The great aim is to get the patients out into the open air for their recreation, not to encourage them to remain within. Provision is made by which beds can be wheeled out on to the terrace, and at each extremity of the pavilions there is a sunroom formed in the turret for patients in the end ward, in addition to a balcony. As regards roofs to terraces and balconies, the lecturer's idea of rolling canvas shop blinds had been adopted. These could be lowered or rolled up at will.

Camberwell Infirmary, Brunswick-square, although technically a parish infirmary, is, owing to its position, really a general hospital, dealing with accident and acute cases of all kinds. The original building in Havil-street the lecturer was altering and modernising to form part of the larger institution. It consists of twenty-one buildings, standing on a site of 4½ acres, practically surrounded by roads, and all buildings are connected by glass-covered ways and subways. It accommodates 800 patients ; has a resident staff of five doctors, while the other officials, nurses, and servants, number about 160. The block plan is as follows :—In the centre of the west front is the administration block, with a pavilion north and south of it. To the east of the administration is a quadrangle, having on the east side the female staff house, and north and south two other pavilions ; to the north-east lies the old pavilion, now divided into three parts. To the east is a circular pavilion, its conical roof, surmounted by a turret, forming a feature of interest in the general composition. To the south-east are the kitchen buildings, the stores, and men-servants' quarters. Further south the laundry engine and boiler houses, the mortuary and ambulance station. All buildings may be reached by the private road on the outside and by covered ways on the inside. The principal buildings are of red brick and Portland stone, the main front forming a flat crescent. The new pavilions are axially north and south. The pavilion to the north—which may be taken as typical of all, although they differ in detail—consists of three main stories and a fourth one over part of the area. It has at the home end a wide staircase, with walls of glazed brick from bottom to top. At the other end it has a secondary or escape staircase, extending from the flat roof to the road, in what is practically a separate tower. There are three exits from the building. On each floor there is a ward of twenty-four beds, with windows on three sides, and other wards of six, four, and two beds respectively, affording opportunity for great classification. There is a ward kitchen. This and the corridors have also all their walls of glazed brick.

The twenty-four, two, and four-bed wards are open to supervision from the ward-kitchen and from each other. All are well lighted and every window opens. There is only one fireplace in each ward, for cheerfulness, the heating proper being by hot water. The large ward on the top floor has been specially designed for consumptive patients, and is a unique provision for a general hospital. Practically the whole of the enclosures on three sides consist of opening windows, for open-air treatment, and above is a flat roof, on which patients may spend all the day with something of interest to see in the panorama stretching across London. Three of the pavilions are so designed. One of the greatest modern improvements in hospitals is the superior accommodation now given to the staff. The female staff home at Camberwell Infirmary is situated in the central quadrangle, with a pleasant garden attached. It has several large rooms for dining, recreation, writing, &c., for nurses and servants. Each of the staff has a separate bedroom, warmed by hot water, with an inlet and outlet ventilator. There are 140 rooms in the building. The lecturer went on to give details of the children's pavilion, the kitchen block, the engine and heating rooms, smithy, shops, boiler-house, and laundries—the most costly block of the whole ; also of the heating and ventilation. The laundries are arranged so that linen received soiled at one end passes through and out clean at the other. Electric fans remove all steam and polluted air. The drying is by hot blast.

In concluding, the lecturer said he trusted he had been able to show that in hospital work there is much to interest the architect. In addition to the general design and detailing of not one but dozens of buildings of diverse purpose, to their grouping and co-ordination so that each may take its proper place among the whole, one has to give special consideration to the medical requirements and hygienic conditions ; to aeration and ventilation ; to the design and organisation of the services for heating and artificial lighting ; for telephonic and other means of intercommunication ; for fire extinguishing ; for transport and commissariat. Unremitting attention is necessary to deal with so much of detail, often not alluring in itself ; but with enthusiasm the dryest bones may be made to live, and to the strenuous man difficulties and new problems are but a spur to greater effort, an added zest to all emprise.

Mr. H. Stannus, in proposing a vote of thanks to Mr. Hall, said it was clear to him that this age was essentially the age of hospitals, and any men who would condense or try to focus all the information that could be gathered on such a subject deserved well not only of posterity, but of all of them who had the benefit of that study. The manner in which Mr. Hall had classified the hospitals, had enabled him to deal with them in a very masterly manner. During the time he (the speaker) had been a member of the Institute he had heard many able papers on various branches of what might be called the specialised work which architects had to carry out. There had been papers on breweries, school buildings, private school buildings, libraries, and now they had a paper on hospitals. He thought that those papers, along with the reports of their Godwin bursaries, were forming what must be an exceedingly valuable collection of information for those who would have to practise in the future in these departments.

Mr. Chisholm asked what was the cost per bed of the Leeds Hospital ?

Mr. T. Blashill said that his qualifications to speak were perhaps questionable, although it was true that a good many years ago, when the pavilion system first became acknowledged to be the proper system for carrying out a hospital, he was honoured by an invitation to compete with a limited number ; and he might say, for the credit of the profession and of the people concerned, they each had what was considered to be a fair premium. He could not quite tell them why, or enter into any reasons, but he did not get the erection of the hospital entrusted to him. It did, however, lead him to see every hospital of the kind which had been built up to that date, and to take a very great interest in the subject, and he believed he stored in his mind a great deal of useful information. People who went in for competitions might get useful information if they got nothing else. He considered that it was a tribute to the authors of the original idea of the pavilion system that it should have undergone so very few modifications since the time he spoke of, which was more than thirty years ago. There was really little in the general arrangement now which was new. The progress which had been made had been by an intense study of details, and, to his mind, what one saw in the modern hospital now, and what they had heard that night, showed what could be done by an intense study of the details of a hospital. He seconded the vote of thanks to Mr. Hall.

Mr. W. G. Wilson said he noticed from the plan of the Frimley Sanatorium that the system of radiating blocks from the centre had been adopted. He had often wondered in seeing the plans of radiating hospitals what the advantage was in having the blocks in *échelon*. It seemed to him that if one particular aspect was best something was sacrificed by setting the blocks all at different angles, although he quite saw that they got closer to the administrative blocks by having the arms radiating. The point, to his mind, was whether they did not lose more than they gained.

Mr. R. J. Angel remarked that he had had something to do with an infectious hospital, and he recollected that when the plans were first sent to the Local Government Board that authority objected to covered corridors between the wards. The plans showed simply roofs upon columns—it was simply a covered way open on both sides, but they objected to it. He understood Mr. Hall to say that his wards were connected by corridors, and would like to know whether they were approved by the Local Government Board.

Mr. Hopkins asked if Mr. Hall had got a balcony in the north and south—one facing due north and one facing due south—and whether he found the one facing north was much good. He would also like to know as to the covering of the floors, for in a visit he paid to a hospital a year ago he found there were waxed teak floors, and complaints were made that children were constantly falling about on them and hurting themselves, and the medical superintendent said he thought plain deal boards were better than teak.

Mr. W. Hilton Nash, in supporting the vote of thanks, said that when they saw such a beautiful building as the Frimley Sanatorium it almost made one wish one had the chance of spending a few months in it. He would like to ask one question as to site. What did Mr. Hall think was the best soil on which a hospital should be built ? In the early part of the paper Mr. Hall thought gravel was not a good soil. He believed that clay, if well drained, was perhaps the best soil for an infectious diseases hospital to be built upon, because it did not absorb the germs. It seemed to him that Mr. Hall had adopted in some of his designs the scheme which was used in the Lariboisière Hospital in Paris. He believed it was first used in London in St. Thomas's Hospital. It was a curious thing that when St. Thomas's Hospital was moved from its old site to that by the river, the old Surrey Gardens building was used as a temporary hospital, and it was found that wounds healed more quickly than in the permanent building. It seemed to him that they might build a hospital too well, and that the walls might be built too thick, and there would be no ventilation through the walls. They all knew that a certain portion of air did pass through the walls, and the question might well be considered as to whether these walls might not be used for hospitals. Perhaps that might be impracticable, but at all events it might be considered.

Mr. J. Osborne Smith said that from one point of view this was one of the most interesting papers he had ever heard in that room. What they had heard that night about fresh air, sunlight, and aspect, and other points of view which concerned health should be very much welcomed in connexion with other buildings besides hospitals. Mr. Hall was very emphatic on these points, and was evidently thoroughly impressed with the necessity for what he called currents of air passing across the building, about the building, and under the building. He remembered once looking into the ward of a hospital which had fixed windows ; there was some air coming into the ward, but the only way by which he could find where it was coming in was by observing that some of the window-blinds were quite black. It was being pumped in, and that seemed to him a most unnatural way of ventilating a hospital, and it had been delightful to him to hear of the way Mr. Hall ventilated

his hospitals. Mr. Hall treated patients like human beings, who wanted fresh air instead of being cooped up and having to breathe air passed along dark passages and dusty flues. It was a mistake to treat hospitals like that, and he was particularly glad that Mr. Hall had emphasised that point.

The Chairman said they were all agreed that they owed a great debt of gratitude to Mr. Hall for the trouble he had taken in preparing the paper, and for bringing his actual working drawings down to them. He did not profess himself to be especially an expert in hospitals, but, like most of them, he supposed it had fallen to his lot from time to time to erect one. The question of the location of a hospital was one that was, of course, constantly occurring in London, and had been much under discussion in the case of one of the most famous of their hospitals. How far it was wise to remove them out of the town and take them far away from the cases which they would have to serve he thought was perhaps open to question. With regard to aëration of the wards which Mr. Osborne Smith had referred to, they would all agree that the more complete the aëration of every ward and the circulation around every ward was, the better, but he ventured to think that that sometimes had been carried somewhat to an extreme, and that, like an accordion, the hospital had been gradually spread further and further out, and wider and wider away, until in one or two well-known cases it took the matron a couple of hours to get from one end of the hospital to the other, and she complained that she really could not go backwards and forwards so far. That was brought out in the well-known case at Belfast, where Mr. Hennen was closing the whole thing up, and trying in the most ingenious way to get over the difficulty, and they must wish him all success in that effort. But, after all, the only thing which really settled these matters as to whether they were good or bad was actual experience when the building came to be used. At the same time it was necessary that some experiments should be made from time to time in these buildings, and everybody was under an obligation to those who were bold enough and brave enough to make these experiments. With regard to the space under the wards to secure this aeration, not only around but over and under, he would like to know if Mr. Hall was quite convinced that that was quite the best thing to do. Like everything else, it had its advantages and its disadvantages. Certainly a disadvantage was that the space under the ward was apt to become a repository for all sorts of things. He built a hospital like that, and he found they had put old beds and mattresses underneath when he visited it a year or two afterwards. He did not suppose that Mr. Hall was able to visit these buildings to see what was put under them, and that was one of the dangers of it. The thickness of the walls had been mentioned by Mr. Nash, and he also would like to hear an answer to that, and whether Mr. Hall used hollow walls or solid piers. Of course, the window space of the sides of the wards was so large that the wall really became only piers, and he imagined, therefore, that he would be obliged to build them solid. He would also like to know the area of glass in proportion to floor area Mr. Hall thought best for the wards. The question of glass area was a very important one, and what might be considered necessary and advisable from the theoretical point of view, was often found to be rather excessive from the patients' point of view, for the light was almost more than they could bear. He was very much interested in the closet blocks which Mr. Hall showed. He meant the closet blocks at the roots of the wards so as to serve the smaller wards as well as the large ones. That seemed a most excellent thing, as it saved the carrying of matter from he smaller wards through the larger ones; bu the little difficulty he had always seen was the disconnexion of these sanitary blocks from the wards. So far as he gathered from the plans, the passage which led from the ward to the closet block was blocked on one side, and they could get an incomplete aeration through it owing to the projection of the other blocks. Another point was the enclosed escape staircase, which seemed to him to be a matter of compromise. Mr. Hall thought it should be enclosed so that the patients could be taken down more comfortably, but the disadvantage was that they got a great projecting building standing at right angles which caused a shade and consequently a cold corner in the ward, and it also prevented the aeration of the ward. He could not think himself that if a patient thought he was going to be burned alive he would have much hesitation in going down an iron staircase.

Mr. Hall: Persons of seventy years of age?

The Chairman said he thought they would get down it. It seemed to him that these walls and the projecting staircase and the projecting closet block would be rather inclined to stop the circulation around the block and to keep out the sun. He did not quite understand the hot-water circulation. He had had to do with heating large separate blocks, and he must say that he had adopted the scheme, which Mr. Hall seemed to think the old-fashioned one, of having for each block a calorifier. He should have thought it better to take the steam to the block than to take the water circulation. It seemed to him, from Mr. Hall's statement, that the whole of the building would have to depend upon one calorifier, and he did not quite understand, if the calorifier went wrong, what would happen.

Mr. Hall: There is a duplicate.

The Chairman said he did not make these remarks at all in the way of criticism of the paper, for he did not profess to be able to do so, but having got Mr. Hall, who had made it a speciality of his own, it was only the duty of the chairman to extract every ounce of information he possibly could.

The motion having been heartily carried,

Mr. Hall, in reply, said that one gentleman asked him a terrible question as to what hospitals cost, and he was rather disposed to think that he had better not answer it. Hospitals were the most expensive buildings in the whole world if attention was given to every little detail. He knew an infectious hospital built not long ago at 250*l.* a bed. He could only say that he was perfectly certain they were not able with all the modern details they put in to build for that. His experience was that they could build a big infectious hospital—he was distinguishing them from others—for something like 450*l.* to 650*l.* a bed. That was the very lowest, and in some places they had cost a great deal more than that. They must remember that an infectious hospital had always twice or two and a half times, and sometimes three times, the cubic space per bed that a general hospital had, and that must be remembered when they talked about the cost of hospitals. He was asked as to the radiation of plans and of aspect. Aspect, again, was relative to the particular disease. Where they had infection they wanted through currents of air to get foulness away, and they wanted the maximum of sunlight because people were confined to their beds. When they came to a sanatorium for consumption not one person in thirty was confined to his bed. All the German experts were pretty well agreed that the best aspect for consumptive treatment was south, south-east, or south-west—in other words, to get the hottest and best sun of the day. He was asked about the radial plan of Frimley, but if they looked at it they would see that every room in it faced south or south-south-east or south-south-west. Each building was parallel with the opposite wing. All the north sides were occupied by corridors simply, and there were through currents of air, of course. With regard to covered ways, he was surprised to hear that the Local Government Board ever objected to a plan with a covered way. He knew of no modern hospital built under the Local Government Board which had not a covered way. He had had to pass through the Local Government Board with many of his plans, and had never had the smallest objection raised to the covered ways. If they had objected to them he would have fought it tooth and nail, because it would mean the staff walking a quarter of a mile with no covering. In Germany they got over it by going under a subway in bad weather, but that was ridiculous. A gentleman asked whether a north balcony in a fever hospital was not objectionable. He thought it was not, because sometimes in the great heat of the summer it was useful to put patients on the north balcony to keep them sheltered from the scorching sun. Camberwell was a general hospital, and not an infectious hospital, and they had different cases to deal with. A hospital essentially built to deal with infectious cases was built on different lines, but in all hospitals they wanted plentiful aëration. That brought him to another point which the Chairman had raised as to the open basement beneath the pavilions. He did not think that was necessary except in infectious hospitals, but in infectious cases it had a most eminently practical advantage, for all the pipes, &c., were in the open air, and when repairs were necessary the workmen did not have to go into the midst of infection. He had never had the misfortune to find his basement filled in with old beds and packing cases. With reference to teak floors, he was surprised to hear that a medical man had said that deal floors were as good as teak. Everyone knew that deal was very soft, and germs could get into it, and the reason teak was used was because it was the hardest wood in the world. Somebody said that teak floors would open, but he was afraid that all wooden floors opened occasionally. He could say with confidence that if you asked twenty doctors what floor they preferred nineteen would say a polished teak floor. Perhaps the twentieth would say he would like a terrazzo floor. But the mode of heating the wards was by flues under the terrazzo floor, and, unfortunately, the nurses were walking on hot bricks all day. Mr. Nash asked for his views as to the best soil for a hospital. In his paper he said that low-lying gravel was bad. If they were on the top of a hill with gravel they were perfectly right and safe. He thought himself that green sand formation was the best they could get, but, of course, they had to build the hospital on the soil of the district where it was wanted. So long as clay was well drained it was all right, but the objection to clay was that it was cold and water would not go down through it, and if they got a great deal of water they got a damp and cold soil. As to thin walls, Mr. Nash mentioned that air came through thin walls, and, therefore, it was beneficial. So it was if it was pure, but they must also remember that they did not generally build so that the air should come through the walls. They generally made other provision, although they could get air through the walls, especially when certain soft stone was used. But if they could provide for the air to come in in the way they designed, and cold clean air came in, it must be better than letting it come through the wall. Again, as the Chairman pointed out, where they had large window areas they must have solid walls to carry the weight, so that in effect they had solid walls. Personally, he never built a hollow wall if he could help it. He fancied he was misunderstood in what he said about hospitals being moved into the country. He said that infectious hospitals should go into the country because of the great source of danger to the neighbourhood, but general hospitals must be where the poor were. With reference to the area of the windows, there, again, it differed in various hospitals. The area for an infectious hospital was about one-fourth of the floor area generally, but for a consumptive sanatorium he would make the whole of one side of the room all glass if he could. With regard to the disconnexion of sanitary towers, they should be disconnected with cross ventilated corridors, and if they looked at the Frimley plans, they would find they were absolutely disconnected. In Camberwell he had not absolutely disconnected them, but it was not an infectious hospital. As to the Chairman's criticism of the enclosed escape staircase, he had seen cases where the people were too nervous to go down high open stairs. But he had another reason for enclosing it, because by that means he would be able to keep off flanking winds from the balcony, which was a great point. At Frimley, in the pavilion he projected the end for the same reason, so that patients were sheltered from flank winds. As to the pumping of water for heating, might he suggest to the Chairman that the system of having a calorifier in each building meant having live steam for it? That meant that they had to pay for live steam. In his system they used exhaust steam, and pumped it, and it cost nothing. He did not hesitate to say that the difference in the cost of maintenance per annum would be about 400*l.* at Camberwell, and they saved that absolutely. They had duplicate calorifiers. Every one knew that in every institution where steam was used they had two boilers, for one might break down. There were hundreds and thousands of mills and factories fitted like that, but they never heard of them being stopped. It was practically impossible for it to go wrong; but if it did go wrong, it merely meant shutting

the valves of one and opening the valves of the next one. In his scheme they had two reserve mains, but in the ordinary system of heating if the steam pipe leaked the system broke down.

The Chairman : Yours is a duplicate main.

Mr. Hall said if they had that they were saved a lot of trouble, but if one of the calorifiers went wrong the whole of the building was out of heat ; and with his system that could not be. They had reverse mains everywhere, and if one broke down it did not affect the others.

Next Meeting.

The Chairman announced that the annual general meeting will be held on May 4, when the annual report of the Council will be presented and other business transacted. He also hoped to have the pleasure of meeting them at another smoking "At Home" on Monday, May 11.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE twenty-fifth annual dinner of the Builders' Clerks' Benevolent Institution was held on Tuesday evening in the King's Hall, Holborn Restaurant, Mr. John Greenwood, C.C., President, in the chair. Amongst the large company present were Messrs. J. Howard Colls, F. L. Dove, J. B. Lee, M. H. Hadland, E. Brooks, F. S. Oldham, R. Gleed, L. Jones, H. W. Parker, and J. Austin (secretary).

The loyal toasts having been honoured, Mr. A. Stansfeld proposed "The Imperial Forces," Major Stanley Clarke suitably responding.

The Chairman then proposed the toast of the evening, "The Builder's Clerks' Benevolent Institution." Having referred to the number of excellent institutions, including trade societies, which exist for the relief of distress, he said that the Builder's Clerks' Benevolent Institution was founded in 1866 for the purpose of granting pensions of 30*l.* per annum to necessitous clerks and of 24*l.* per annum to their widows, and for the maintenance and education of their orphans and for making grants of temporary relief. The orphans were well looked after, not only by the committee of the school to which they were sent but also by the committee of the Institution. The school committee as a rule found situations for those who had been in the schools and even watched over the orphans after they were twenty-one years of age. The income of the Institution last year was 756*l.*, and since they had been established they had given away in pensions and in the maintenance of the orphans upwards of 10,000*l.* Subscriptions in aid of this deserving Institution were always thankfully received and properly applied.

The toast having been honoured,

Mr. J. Howard Colls proposed "The Architects and Surveyors." He said it needed no very observant eye to see the great advance which architecture had made throughout this country in recent years. People used to talk about the decline of architecture and refer to the fourteenth, fifteenth, and sixteenth century buildings being so much finer than those of the present day. That was true not many years ago, but he thought that we could claim that the twentieth century will show future centuries what good work was being done at the present time. The connexion between architects, surveyors, and builders was a close one, and was of a fairly satisfactory kind. The building trade was just now undergoing a rather curious development; it was rapidly being altered, though he did not think the change he referred to would last long. Drapers, restaurant-keepers, and others were becoming builders in large numbers, and they seemed to think that they could build better than the man who had been trained and brought up to the work, and they were undertaking some large contracts. Sooner or later, he believed, the general public would see that the good old system was better and more to be relied on for carrying out the contracts of the country. It was very desirable that the profession of architecture should, as a rule, be kept distinct from that of quantity surveying, for the architect who dabbled in quantities generally "made a mess of it," and the quantity surveyor who attempted to design a building did not often produce an artistic result. It was the same with builders. It was impossible for the architect to carry out his own work as work was done now—in the rush, &c., with which it had to be done, and it was impossible for a builder to think of designing buildings. The present division of labour between architects, surveyors, and builders was, on the whole, a good one. With the toast he coupled the name of Mr. Hadland.

Mr. Hadland, in response, said it had always struck him as a singular fact that on these festive occasions, although the toasts of architects, surveyors, builders, builder's merchants, &c., were honoured, yet a toast to the building owner was never given. It seemed to him singular that that should be so, for it was the building owner who called forth the art of the architect, created the building trade and called into existence the builder's merchant. Perhaps the reason for this omission was that it was thought that the building owner was a man to be envied rather than conciliated, for he could have no difficulty in finding an architect to design for him, a builder to build rapidly for him, and merchants to supply every kind of material he required.

Mr. R. Gleed, in proposing "The Builders," said that the various attempts to do away with builders had been unsuccessful in the past, and he thought such attempts would fail in the future. The professions connected with building were greatly helped by responsible master builders, for they were spared many irksome duties and monetary anxieties and worries by builders. Architects who tried to be their own builders did not, as a rule, take the risk themselves ; they had to persuade clients to take it for them and they seldom persuaded them twice. The builders, on the other hand, were always ready to come forward and take financial risks and keep things going.

The toast was coupled with the name of Mr. F. L. Dove, who, in reply, said the builders' trade was a harassing one, but master builders were conscious of the valuable services rendered to them by their clerks.

Mr. Oldham, in proposing the toast of "The Donors and Subscribers," said he was glad to say that they had received about forty new subscribers from builders' clerks themselves.

Mr. Lewis Jones having briefly replied,

Mr. Edwin Brooks, the Treasurer, proposed "The President," and in the course of his remarks he said it was a welcome fact that more clerks had come forward to help the Institution. If builders' clerks took a little more interest in the Institution, it would provide the best old age pension of any society in London.

The President suitably replied, and then proposed "The Executive." The affairs of the Institution were admirably looked after, he was glad to say. There was no doubt that the Institution did much good, for there were many clerks who, through no fault of their own, required assistance from time to time.

With the toast he coupled the name of Mr. H. W. Parker, who replied.

In the course of the evening the Secretary read a list of subscriptions received or promised, amounting to over 240*l.*, including 25*l.* from the President.

COMPETITIONS.

SCHOOLS, WHITLEY. — The last ordinary monthly meeting of Whitley and Monkseaton School Board was held in the Council Buildings, Whitley. The board formally announced their award in connexion with the competitive designs submitted by architects for the building of the new permanent schools. According to the numbers on the plans, the result is as follows :—Mr. W. H. Knowles, Grainger-street, Newcastle-on-Tyne, first, who will be employed as architect to carry out the work; Messrs. Cackett & Burns-Dick, Newcastle-on-Tyne, second, awarded 40*l.*; Mr. Stephen Wilkinson, Newcastle-on-Tyne, third, awarded 20*l.*; and Messrs. Armstrong & Wright, Newcastle, fourth, special award of 10*l.*

THE QUEEN VICTORIA MEMORIAL AT ROCHDALE.—The Rochdale Queen Victoria Memorial Committee have accepted the plans sent in by Messrs. Woodhouse & Willoughby, of Manchester, for the erection of a new nurses' home on the site of the Grammar School, Sparrow Hill. The Committee offered premiums for the best set of plans and designs. Nine sets were sent in. In deciding upon them the Committee have had the assistance of Mr. H. Littler, of Preston, the county architect, as assessor. Messrs. Woodhouse & Willoughby were awarded the first place, and their plans have been adopted. A premium of 20 guineas for the second best set was awarded to Mr. Jesse Horsfall, of Todmorden, and that of 10 guineas for the third to Messrs. Butterworth & Duncan, of Rochdale.

TECHNICAL SCHOOLS, BLACKPOOL. — Some time ago the Technical Instruction Committee of the Blackpool Town Council invited designs for a new technical school, to be erected on a portion of the Raikes Hall Gardens site. On account of certain conditions imposed, the whole of the local architects at first declined to compete, but, on the stipulations being somewhat modified, they decided to send in plans. The 14th inst. was the last day for receiving plans, but on that day the local architects asked for an extension of time. The Committee, after a lengthy discussion, declined this, on the ground that it would not be fair to those architects who had already submitted plans, and there the matter stands, much to the disgust of the local architects.—*Liverpool Post.*

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the evening meeting on April 15, Dr. Winstone in the chair, Mr. P. Scott exhibited an illustration of a handsome specimen of an original rain-water pipe head, still to be seen on the front of an old house in High-street, Birmingham, where it joins New-street. It is dated 1687, and bears the initials I ¹A, placed over a human face with wings on each side. The date of its erection is the same as that of the old meeting-house, which was the first Dissenting place of worship in that city. The pipe head is believed to be of lead, but is covered thickly with paint.—A paper was read by the Rev. W. S. Lach-Szyrma on "The Mining Tribes of Ancient Britain." One of the most difficult problems in our early British history is to reconcile the seeming discrepancy between the archæological remains in England of a remote epoch and the records of Britain as given by the old Greek and Roman classical authors. The Britain of Cæsar and of the old Roman writers does not seem the same as the Britain of the monuments. There is one mode of explaining these differences, *i.e.*, by supposing that the records of Cæsar and others relate to the beginning of the Christian era, either a little before or after, and that these monuments belong to a remote antiquity, to the Palæolithic or the Early Bronze period. This may be partially true, but it is weighted with the theory that a lower stage of culture superseded a higher, for certainly the "old men" of Cornwall were in some points more cultured than the rude Britons who fought with Cæsar : they were dwellers in stone houses ; they had apparently a complete system of religious worship, and that not exactly Druidical, for the stones rather than forest recesses were their temples. Again, most of these monuments may be very ancient, but some evidently must have been after the Roman conquest, for they are inscribed, and even after the conversion of Cornwall to Christianity ; indeed, there is reason to think that the Cornish Celtic cross was a last Christianised survival of the old Celtic *men-hir*. The author suggested that just as we can attempt to illustrate some of the earliest problems of Neolithic man in Europe by the existing records and habits and customs of primitive men in Australasia, so, in this second stage of civilisation, we can have some light thrown on our British problem by the American tribes found by the followers of Columbus, and even as they exist at this day in America where unchanged by European influence. Speaking roughly, we find in America to-day two classes of Indians—the hunter tribes now in Canadian reserves, and those of the Western States, hunters and fishers by choice, living in the forests ; and, on the other hand, the mining Indians of Central and South America. Probably when Julius Cæsar came to Kent, or Claudius Cæsar stayed at Colchester, Britain was peopled by two classes of British tribes, the one being the hunters and fishers, the wild warriors who stript to fight and put on their war paint, like the Irroquois or Mohawks of old Colonial history ; the other the more peaceful mining tribes of the far West, not merely of Cornwall, but of Devon, who lived in stone houses, who worshipped the "big stones" with rites founded on Sun-worship, and, perchance, sometimes used flowers in their summer festivals, who were buried under stones, cromlechs, and

cairns, and reared rude obelisks to commemorate national events. Such were the Cornu-Britons of old time, and such, in a higher grade of culture, were the Peruvians of America, and in a lower stage to this day the minor tribes of the Indians in the Andes. The problem of the seeming contradiction of the archæological remains to the written records of old Latin writers, the author considered, might be solved by supposing the one refers to the mining and hill tribes of the West, the other to the hunting and pastoral warriors of the East and Midlands. The Chairman, Mr. Rayson, and Mr. Patrick took part in the discussion upon this interesting paper.

DURHAM AND NORTHUMBERLAND ARCHÆOLOGICAL SOCIETY.—The annual meeting of the Durham and Northumberland Archæological and Architectural Society was held on the 21st inst. in the University Lecture Rooms at Durham. Canon Greenwell, the President of the Society, occupied the chair. The Report of Mr. J. G. Gradon, the treasurer, stated that the total income, including a balance of 158*l.* brought forward, was 248*l.* After meeting all the expenditure, there was a balance of 199*l.* to carry forward. The Report was adopted. The election of officers resulted in the reappointment of Canon Greenwell as President, with Mr. R. O. Heslop and Mr. R. M. Knowles Hon. Secretaries, and Mr. J. G. Gradon as Secretary and Treasurer. It was decided to visit the following places during the present year:—1, Haltwhistle, Williamswick and Bellingham; 2, Warkworth, Guisance, and Felton; 3, Seaham, Dalton-le-Dale, Dawdon, and Easington; 4, Tanfield and Kirklington; and 5, a two days' excursion to Hull, Heddon, Patrington, Welwick, Barton-on-Humber, and Thornton Abbey. The President afterwards delivered an address, in the course of which he gave a *résumé* of the places visited during last year. Speaking with regard to the disposition of the balance of nearly 200*l.* in the hands of the Society, he suggested that this sum, or some of it, should be devoted to the purpose of printing the transactions of the Society. They had some most interesting things in the shape of pre-Conquest stones, crosses, and grave covers scattered throughout the two counties of Durham and Northumberland. He proposed that they should, in addition to an account of the meetings of their Society, include an account of the whole of the sculptured Pre-Conquest stone in the two counties, commencing at Hartlepool and going northwards, until they had completed the whole. They would have to have the stones represented by some photographic or other process. Proceeding, the President mentioned that in connexion with the Cathedral the road going through from the cloisters into the cemetery and the monk's ante-chamber to the Chapter House had been cleared out, and a good deal of old work had as a consequence been made visible. In regard to the castle, the Rev. Dr. Gee, the new master of University College, had determined to draw up an account of the castle which the President hoped would be produced in a separate book. Plans were being prepared by Mr. Hodges for the work, which he hoped the members of the Society would assist in obtaining subscribers for. Dr. Gee had also undertaken to have some excavations made, which he trusted would throw some further light upon what was the character of the original castle built by William the Conqueror. Since then the castle had passed through a number of alterations, but, notwithstanding, it still possessed the main characteristics of an important castle of the first magnitude.—At the conclusion of the meeting those present were conducted to the cloisters, where the excavations in connexion with the monks' lavatories, &c., were pointed out and explained by the Rev. W. Brown and Mr. Freeman, chief verger at the Cathedral.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

AT the meeting of the Building Act Committee of the London County Council, held on the 6th inst., the proceedings were governed by the clause in the order of reference which empowers the Committee at certain seasons to act on behalf of the Council in relation to matters included in the Committee's order of reference.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Whitechapel.—An extension of the shop front of No. 245, Whitechapel-road, Whitechapel (Mr. R. A. Hinds, for Mr. Owen and Messrs. McKay and Ryland).—Consent.

Chelsea.—A porch at the entrance to a building on the site of Nos. 244, 246, and 248, King's-road, Chelsea (Messrs. Lansdell & Harrison, for the Chelsea Board of Guardians).—Consent.

Finsbury, East.—Buildings on the site of Nos. 152, 152A, 154, 156, 158, and 160, City-road, Finsbury (Messrs. Cluttons, for the Ecclesiastical Commissioners).—Consent.

Hackney, South.—A warehouse building at No. 17, Sutton-place, Hackney, to abut upon Urswick-road (Mr. J. Hamilton, for Mr. T. C. Wootton).—Consent.

Kensington, South.—Buildings on the southern side of Old Brompton-road, Kensington, between Sumner-place and Onslow-crescent (Mr. W. Weaver for the Royal Borough of Kensington).—Consent.

Kensington, South.—The retention of an iron and glass shelter in front of No. 11, and the erection of iron and glass shelters in front of Nos. 14, 59, 70, 82, and 83, Holland Park, Kensington (Mr. W. J. Kemp for the executors of the late Mr. F. Radford).—Consent.

Lewisham.—A porch in front of No. 73, Burnt Ash Hill, Lee (Messrs. G. Bush & Son for Mr. F. Zurhorst).—Consent.

St. Pancras, South.—Retention of a projecting arc lamp at No. 8, Charlotte-street, Fitzroy-square, St. Pancras (Mr. G. Vernon for Mr. M. Siari).—Consent.

Wandsworth.—Buildings on the site of Nos. 326 and 328, Balham High-road, Wandsworth (Messrs. Benison & Bargman for Mrs. M. Messent).—Consent.

Westminster.—One-story shops and an entrance porch in front of Nos. 153, 155, 157, 159, and 161, Victoria-street, Westminster (Messrs. Z. King & Son for Mrs. M. Hiscox, Mr. J. T. Hiscox, and Mr. R. T. Raikes).—Consent.

Woolwich.—Additions to Redcroft, Court-road, Eltham (Mr. J. O. Cook for Mr. J. T. North.—Consent.

Kensington, South.—The retention of a show-case in front at No. 18, Beauchamp-place, Brompton-road, Kensington (Mr. B. E. Walker for the Goodwill Work Society).—Consent.

Wandsworth.—The retention of a wooden cycle shed in the garden of Lingmell, Putney Heath, Wandsworth (Mr. J. Henry).—Consent.

Clapham.—Retention of wooden porches and balcony fronts at Nos. 134-139 (inclusive) Rodenhurst-road, Clapham (Mr. W. N. Dunn for Mr. R. Maeers).—Consent.

Hammersmith.—Buildings, with one-story shops in front, at Nos. 91 and 93, Goldhawk-road, Hammersmith, to abut also upon The Grove (Mr. W. G. Hunt for Dr. F. H. Alderson).—Consent.

Islington, West.—That the Council do not accede to the request of Mr. A. Dixon on behalf of Messrs. Whitbread & Co., Limited, for permission to retain a projecting sign at the Lincoln Arms beer-house, No. 52, York-road, King's Cross.—Agreed.

Kensington, South.—The retention of a projecting doorway in front of a block of residential flats, known as Cecil Court, on the south-west side of Hollywood-road, Kensington (Mr. C. J. C. Pawley).—Refused.

Wandsworth.—A building on the eastern side of Mitcham-road to abut upon Undine-street (Mr. H. Bignold for Canon St. John).—Refused.

Width of Way.

Camberwell, North.—A car-shed at the Camberwell tramways depôt on the south side of Medlar-street, Camberwell (Mr. E. J. Edwards for the Highways Committee of the Council).—Consent.

Kennington.—An addition and boundary fence at Albert-buildings, Randall-row and Randall-road, Kennington (Mr. H. H. Bartlett).—Consent.

Poplar.—Buildings on the south side of Leicester-street, west side of Gaselee-street, and south side of Norfolk-street, Preston's-road, Poplar, with the boundary fences between the external walls of such buildings and the roadways of Leicester-street, Gaselee-street, and Norfolk-street (Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.

St. George-in-the-East.—A building upon the site of Nos. 7 and 8, Wellclose-square, St. George-in-the-East, to an increased height and at less than the prescribed distance from the centre of the roadway of Shorter-street (Mr. T. J. Fox for Mr. G. E. Weston).—Consent.

Kensington, South.—A projecting porch to a building on the west side of Brown's-buildings, Kensington High-street (Mr. P. E. Pilditch for Messrs. J. Barker & Co., Ltd.).—Refused.

Width of Way and Lines of Frontage.

Haggerston.—Public baths on a site abutting upon the north side of Mansfield-street and south side of Laburnam-street, Shoreditch (Mr. A. W. S. Cross for the Council of the Metropolitan Borough of Shoreditch).—Consent.

Strand.—An iron and glass shelter over a proposed entrance in Northumberland-street to the grill room at the Grand Hotel, Charing Cross, Strand (Mr. W. Woodward for the Gordon Hotels, Limited).—Consent.

Peckham.—Six houses on the site of No. 26, Elmgrove, Peckham (Mr. E. Crosse for Messrs. J. & A. Oldman).—Refused.

Space at Rear.

Battersea.—A modification of the provisions of Section 41 with regard to open spaces about buildings, so far as relates to the proposed retention of a house on the east side of Battersea Bridge-road northward of Nos. 61 to 80, Cambridge-mansions, with an irregular open space at the rear (Mr. G. S. Wain for Mr. H. W. Reeves).—Consent.

Chelsea.—Deviation from the plans approved in November, 1901, in respect of the erection of a block of residential flats on plots Nos. 1 to 4, Cheyne-walk, Chelsea, at the corner of Beaufort-street, with an irregular open space at the rear, so far as relates to an alteration in the line of the rear wall of the said block and an increase in the height of such wall at its northern end (Messrs. Dunn & Watson for the Town and Gown Association, Limited).—Consent.

Norwood.—A modification of the provisions of Section 41 with regard to open spaces about buildings, so far as reates to the proposed erection of a house on a site on the north side of Lambert-road, Norwood, abutting upon Strathleven-road (Mr. C. M. Quilter for Mr. W. Pitman).—Consent.

Hammersmith.—A modification of the provisions of Section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a house on the north side of Hammersmith-terrace, Hammersmith (Mr. G. Saunders).—Refused.

Deviation from Certified Plans.

Whitechapel.—Deviations from the plan certified by the District Surveyor, under Section 43 of the Act, so far as relates to the proposed erection of two houses on the site of Nos. 32, 34, and 36, Pelham-street, Spitalfields (Mr. J. R. Moore-Smith for Mr. J. Donn).—Refused.

Formation of Streets.

Lewisham.—That an order be issued to Messrs. Llewellyn & Pawley, sanctioning the formation or laying out of new streets for carriage traffic, on the Bromley Park estate, Bromley-road, Lewisham (for Mr. S. Cawston).—Consent.

Clapham.—That an order be issued to Mr. C. G. St. John sanctioning the formation or laying out of a new street for carriage traffic in continuation north-eastward of Elmhurst-street into Manor-street, Clapham.—Consent.

Lewisham.—That an order be issued to Mr. J. Stanford sanctioning the formation or laying out of a new street for carriage traffic to lead from Mount Pleasant-road to Fordyce-road, Lewisham.—Consent.

Wandsworth.—That an order be issued to Messrs. Holloway Brothers, sanctioning the formation or laying out of a new street for carriage traffic to lead from Burntwood-lane to Magdalen-road and two new streets out of the east side of Tranmere-road on the Magdalen College estate, Garratt-lane, Wandsworth.—Consent.

Artisans' Dwellings.

Hackney, North.—Deviation from the plans sanctioned in June, 1901, for the erection of three blocks of working-class dwellings on a site on the west side of High-street, Stoke Newington, at the corner of Victoria-road, so far as relates to the erection of two shelters, a workshop, and a store, and a range of perambulator sheds (Messrs. N. S. Joseph, Son, & Smithem for the Four per Cent. Industrial Dwellings Co., Ltd.).—Consent.

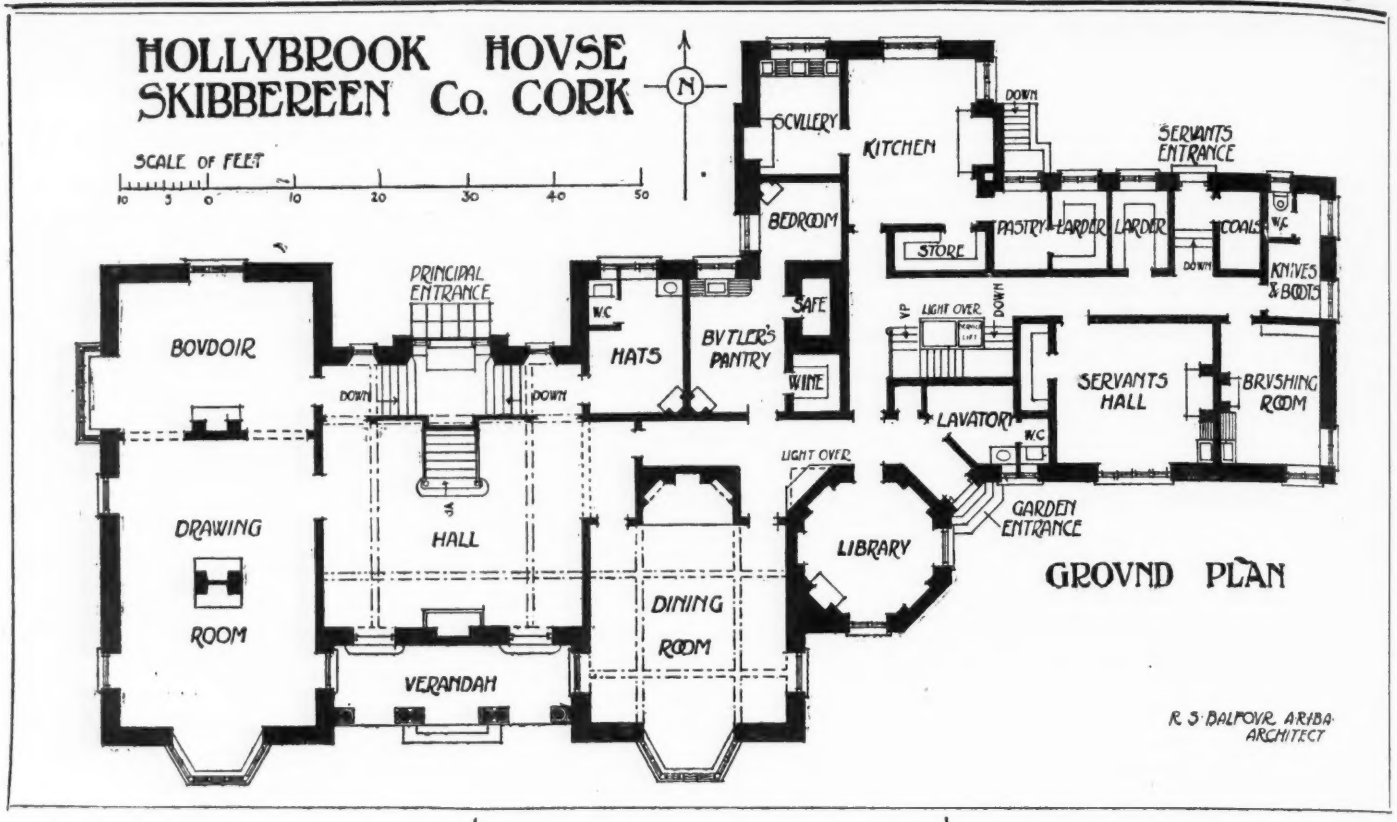
Means of Escape at Top of High Buildings.

City.—A deviation from the plans approved in March, 1903, in respect of the means of escape proposed to be provided in pursuance of Section 63 of the Act, on the fourth story of the Wesleyan Centenary Hall, Bishopsgate-street, City (Messrs. Gordon & Gunton for the Trustees of the Wesleyan Missionary Society).—Consent.

Paddington, South.—That Mr. F. T. Verity be informed that the Council has considered the drawings submitted by him on behalf of the executors of the late Mr. A. Bush, showing the means of escape in case of fire proposed to be provided in pursuance of Section 63 of the Act, on the fifth story of Nos. 12-17, Hyde Park-place, Bayswater-road, Paddington, and that upon completion to the satisfaction of the Council of the said means of escape . . . . the Council will issue a certificate under the said section.—Agreed.

Buildings for the Supply of Electricity.

St. George, Hanover-square.—A deviation from the plans approved in April, 1897, for the erection of an addition on the north side of the generating station and works on the site of Nos. 87, 89, and 91, Davies-street, Oxford-street, so far as relates to the setting back of the front wall of such addition (Mr. C. S. Peach for the Westminster Electric Supply Corporation, Ltd.).—Consent.



Illustrations.

DETAIL OF CENTRAL DOORWAY, SIENA CATHEDRAL.

THIS illustration shows to some degree the extraordinary minuteness of the detail in the façade of Siena Cathedral. It is said to have been sculptured by Giacomo di Buonfredi about the year 1377. The general design of the façade is attributed to Giovanni Pisano, who was chief architect to the Duomo in 1290. It is certain that Giovanni made a design, and that after his death in 1299 certain changes were made. In 1310 a commission of ten master builders was formed to superintend the work.

Giovanni was the son of Niccolò Pisano, celebrated for the pulpit at Pisa and the less beautiful pulpit at Siena. Both father and son were veering towards Gothic, retaining the classic instinct for horizontal lines in the design, the semi-circular arch in the nave with pointed clearstory windows over, round arches to the doorways and windows with the super-imposed gables as richly pinnacled, niched, and sculptured as any Gothic cathedral.

The abortive attempt to enlarge the Duomo by adding a huge nave and turning the present church into the transepts took place about 1320. The unfinished walls and foundations commenced for this purpose are as interesting as any part of the finished church.

S. GIOVANNI AND PALAZZO MICHELETTI, FROM CATHEDRAL, LUCCA.

S. GIOVANNI, a twelfth-century basilica, is of little interest but for the picturesque grouping the campanile makes with the roof of the adjoining baptistry.

One of the main piers of the façade of the cathedral is shown in the sketch, and is a typical example of the application of party-coloured marbles. F. T. V.

PALAZZO CONTARINI, VENICE.

THIS is one of the many palaces in Venice of the same name. It is in the Pointed style of the fifteenth century, showing the ogee form of arch and curious dentil moulding which is peculiar to Venice. F. T. V.

ART SCHOOL, HULL.

THIS building is now being erected at a cost of 12,000*l*. The elevations consist of red brick and Ancaster stone dressings; the pediment is intended for a glass mosaic design.

The view illustrated is not the original drawing submitted in competition, but he design has not been departed from in any important details.

The builders are Messrs. Hockney & Liggins, of Hull; and the architects Messrs. Lanchester, Stewart, & Rickards, of London.

HOLLYBROOK HOUSE, SKIBBEREEN, CO. CORK.

THIS house is being erected in a somewhat remote district in the south-west of Ireland, not far from the site of the old mansion on the demesne which was demolished a few years ago.

Pleasant woods surround the new house on the north and east sides, and the principal rooms command a fine and characteristic prospect to the south and west.

The external walls are being built of the rough stone furnished by the quarries on the estate, but they will subsequently be rough cast to keep out the weather.

There are fifteen bed and dressing-rooms in all, and a storage tank for water occupies the upper portion of the octagonal tower seen in the view.

FREE LIBRARY, KETTERING.

WE give the principal drawings of the selected design for the new Free Library at Kettering, by Messrs. Goddard & Co., of Leicester.

The plan is arranged by the architects with a view to economy of working. Supervision is obtained from the delivery counter over all parts, and all readers entering or leaving must pass under the eye of the assistants. No room is used as a passage-room.

The vestibule has been made sufficiently large to give wall space for the advertising columns of the local papers, which the public can thus consult before the library proper is open, or afterwards without disturbing the readers in the newsroom.

The hall is divided from the rooms by cased stanchions, in order to reduce the piers and prevent obstruction of light. The rooms are all easily accessible from the hall. The stack room is lighted from the north, on the usual weaving-shed plan, and provides accommodation for 34,700 volumes. The reference room has space for seventy-six readers, and shelf accommodation for 6,460 volumes.

The librarian's room adjoins the stack room and reference room, having also separate access to the entrance hall. Out of this room opens the space for rare books in the form of a strong-room, with steel wire gates and a ventilating flue.

For the exterior a red sand-brick with Ketton stone dressings is to be used. The screens and panelling to the entrance-hall and the woodwork generally, are to be in red deal painted. Floors to be of pitch pine wood blocks throughout, except entrance-hall and vestibule.

Heating to be by low-pressure hot water with ventilating radiators. Extracting trunks will be provided in the void spaces of the roofs. Lighting to be by electricity.

The architects estimate the cost at 6,460*l*.

ARCHITECTURAL SOCIETIES.

ARCHITECTURAL ASSOCIATION OF IRELAND.—The closing general meeting of the session of the Architectural Association of Ireland was held on the 21st inst. at 20, Lincoln-place, the outgoing President, Mr. Fred G. Hicks, in the chair. The result of the ballot for officers and committee for the ensuing year was declared as follows:—President, Charles H. Ashworth; Vice-Presidents, H. Allberry and T. H. Webb; Hon. Treasurer, E. Bradbury; Hon. Librarian, T. Cullimore; Hon. Secretaries, A. E. C. Millar and F. Hayes; Hon. Auditors, P. F. O'Sullivan and G. R. Carringham; Committee: Messrs. Hicks, Sheridan, O'Callaghan, M'Carthy, Beckett, Holloway, Mitchell, Geoghegan, and Coleman. The Chairman, in the course of a valedictory address, said that in his opening address he laid some stress on the subject of examinations by the Royal Institute of the Architects of Ireland, which he was gratified to know was very favourably received by the members generally, and a deputation was appointed to wait on the Institute in connexion with this very important move. This deputation was received by the Council of the Institute. Since then committees representing both bodies had been appointed and met jointly, and made very good progress towards achieving this very desirable end. Architecture, like everything else in this country, was going to advance, and the rising generation must be in a measure responsible for this advancement. It was gratifying to know the Government contemplated spending some millions on technical education in that country. He hoped architecture and the allied arts would not be lost sight of. Why should not there be sentiment about a farm-house as much as about the land surrounding it?—and there would be if a proper system of technical education were put forward and taken full advantage of, and the 12,000,000*l*. they were threatened with were properly expended. He was very fond of their little society, which, but for the continued generosity of Sir Thomas Drew, was practically homeless. The London Association had premises given to them, and he thought they might make it known that they should not be too proud to accept a similar gift.

BUSINESS PREMISES, EDINBURGH.—An extension is to be made to the premises of Messrs. Jenner & Co., in St. David-street and Rose-street, Edinburgh. The new buildings carry the old premises right up to Rose-street, the St. David-street frontage then being 220 ft., and there will be a frontage in Rose-street of 100 ft. The architect is Mr. A. R. Scott, of Edinburgh.

Books.

The Civil Engineer's Pocket-Book. By JOHN C. TRAUTWINE. Revised by JOHN C. TRAUTWINE, jun., and JOHN C. TRAUTWINE, third. Eighteenth Edition, Seventieth Thousand. New York: John Wiley & Sons; London: Chapman & Hall, Ltd. 1902.

IF one were asked to name the two books most valued by the practising engineer in this country, the answer would almost certainly be "Rankine" and "Molesworth." The works familiarly known by these names require no further designation for the purpose of identification. As a comprehensive treatise on civil engineering, the former justly occupies the premier position, and it is equally valuable as a book of reference; while the latter is regarded as an indispensable item in the literary equipment of every engineer's office. The volume which is the subject of the present review also deserves an honoured place in the professional library, and we commend it to the architect quite as much as to the civil engineer. In some respects, Trautwine's "Pocket-Book" combines the features presented by "Rankine" and "Molesworth," for it is both a treatise and a pocket-book, avoiding wearisome mathematical complication on the one hand, and undesirable brevity on the other. Holding the opinion that even those who have been tolerable mathematicians in youth can seldom spare the time for retaining such an accomplishment in after business life, the author has aimed at the presentation of principles and facts in such a way that everybody may understand his meaning. Even in these days of technical education we believe there must be many sympathisers with so sensible an aspiration. In this connexion it may be interesting to quote one or two brief passages from the preface to the first edition of the work, of which one leading object has been "to elucidate, in plain English, a few important elementary principles which the *savants* have enveloped in such a haze of mystery as to render pursuit hopeless to any but a confirmed mathematician." Believing that comparatively few engineers are good mathematicians, and that nearly all the scientific principles which constitute the foundation of civil engineering are susceptible of complete explanation to any person who really possesses a sound elementary knowledge of arithmetic and natural philosophy, Mr. Trautwine does not entirely approve such engineering treatises as those of Rankine, Moseley, and Weisbach, saying that "although their books are the productions of master-minds, and exhibit a profundity of knowledge beyond the reach of ordinary men, yet their language also is so profound that very few engineers can read them." The writer himself, having long since forgotten the little higher mathematics he once knew, admits that he cannot understand them, and adds that "to him they are but little more than striking instances of how completely the most simple facts may be buried out of sight under heaps of mathematical rubbish." We know that these opinions were written more than thirty years ago, but, nevertheless, they will still find a responsive echo in the minds of practical engineers who regard mathematics as a "means" and not as an "end."

To discuss, or even to refer to, all the contents of this book, consisting as it does of more than a thousand pages of closely printed matter, would be too great an undertaking for a review such as the present. Among the chief subjects included are the following: Mathematics, Surveying, Natural Phenomena, Mechanics, Strength of Materials, Hydrostatics, Hydraulics, Constructions (including foundations, masonry, bridges, and roofs), and Materials (giving details concerning structural iron and steel, stone, bricks, cement, mortar, and sundry building operations and materials). Under the heading of Mathematics, we notice a new and enlarged table of five-place logarithms, in which the differences are more nearly constant than in the older form of table. There is also a new article describing the Logarithmic Chart and Slide Rule, the use of which should be very convenient in hydraulic and other computations. Two sections of the book that have been rewritten are those on Statics and on Beams. The title "Statics" may be thought to have a dry, theoretical sound, but the paragraphs relating to the thrust and resistance lines of arches, dams, &c., and to the forces acting upon beams and trusses, are particularly interesting, while the Practical Considerations stated in separate paragraphs ought to be read. As it now stands, the section dealing with Beams is well up to date, and includes two somewhat unusual cases, the cross-shaped beam and the resistance of plates. Although the laws governing the resistance of a plate supported along its edges are but imperfectly understood, the rules given may be of service in arriving at approximate calculations of the strength of slabs and plates used as covers, or of monolithic floors. Under the head of Constructions, the chapter on Foundations is particularly noteworthy as dealing with practically every known method of work, and the same remark applies to the chapters on Stone and Brick Arches. In opening the general subject of Trusses, the author remarks that "the design, construction, and erection of trusses have become a specialty to which persons confine themselves more or less exclusively, and thus attain a degree of experience beyond the reach of the general engineer." These observations must, of course, be taken as applying more particularly to bridge design, and so far we quite agree with them, for most of the monstrosities in modern bridge-building are due to the trial essays of engineers unaccustomed to such work. As to the more general application of the truss in construction, it is necessary that every architect, and most engineers, should be familiar with the principles involved. Roof Trusses, both in steel and in timber, are briefly considered, and a good many drawings are given of details. Rivets and Riveting also form the subject of an interesting chapter. In the concluding section of the book there is much valuable information upon various materials of construction, but we are rather sorry to find that neither in the article on Cement nor elsewhere is there any reference to armoured cement, or armoured concrete. As this is admittedly the most important combination introduced within recent years, the omission seems to be unfortunate, although we have no doubt it may be intentional. The present edition contains about 100 pages more than its immediate predecessor, and altogether twenty of the articles have been almost, or entirely, rewritten. The general arrangement of the book is excellent, it has a copious index, and it opens so that the lines are parallel with the line of sight, the last being a very strong recommendation to busy men.

Statics by Algebraic and Graphic Methods. By LEWIS J. JOHNSON, A.M.Am.Soc.C.E., Assistant Professor of Civil Engineering, Harvard University. New York: John Wiley & Sons; London: Chapman & Hall. 1903.

THIS volume is a very successful attempt to make clear the general principles of statics, to define the inherent mathematical limitations of the science, and to show how its most important problems may be solved by analytical and graphical methods. The treatise, which is primarily intended for students of architecture and engineering, is divided into two parts, Part I. being devoted to the enunciation of general principles and methods of solving statical problems, and Part II. to applications of statics in actual practice. In a work of this nature new matter is not to be expected, and the chief object of interest is the manner in which the author presents well-known facts and develops his subject. The first three chapters, occupied by the definition and explanation of various preliminaries, are sufficient to show the ability of the author to express the abstract in succinct language easy of understanding by the beginner. Statical problems deal with bodies conceived to be in a condition of equilibrium, under the action of certain forces, and the solution of such problems consists in finding the value for each unknown element. As Professor Johnson remarks in Chapter IV., this at once suggests the use of algebra, and the principal task is to find how to write equations truly representing the conditions—that is, which will be true only if equilibrium is established. Having shown that a set of forces will be in equilibrium if they can result in neither (A) translation nor (B) rotation, the author, confining attention to coplanar forces, proceeds to establish first the algebraic, and then the graphic, equivalent of (A) and (B), in a manner that leaves very little to be desired. The chapter is concluded by a summary of the six ways of stating the conditions of equilibrium, and the summary is arranged so as to be valuable for after reference by the student. A brief but logical survey of the scope of pure statics is contained in Chapter V.; and in the next chapter the methods of solution for the four most important "cases" are taken up—these cases being the only four of importance that are capable of solution by pure statics. As elsewhere in the treatise, algebraic and graphic methods are placed one after the other, so that the student may become familiar with each. The practice of using both methods not only enables results to be checked, but also helps to a clear perception of the operations performed.

Part II. commences with a chapter on "Centres of Gravity," wherein the difference between a true centre of gravity, and the centre of mass or area, is mentioned. The distinction is discussed in books on mechanics, but it is not of practical importance, and the ordinary definition may safely be accepted. In Chapter IX. the author adopts a definition of stress which is now generally considered to be inaccurate in this country. He says, "stress is the tendency to distortion or rupture in a body due to the action of the external forces." This is the theory enunciated by Lord Kelvin (then Sir William Thomson) in 1856. In the present day it is almost universally accepted that stress denotes the force, or combination of forces, exerted by the molecule of a solid under the action of external forces, in tending to recover its free condition, and which, for a state of equilibrium, is equal and opposite to the combination of the external forces applied to it. In one case stress is represented as pressure, and in the other as a force opposed to pressure or to any applied force. The discrepancy is clearly one that ought not to be perpetuated for the confusion of students. After further chapters, dealing with "structures," "stresses in non-framed structures" and "stresses in framed structures," wherein instructions are given for determining stresses, and for the guidance of the student with regard to exercises, some more complicated cases are considered. The sources of difficulty are divided into four classes, and the examples taken include such structures as the Fink truss, the bents of a mill building, the cantilever bridge, the three-hinged arch, and the hammer-beam truss. This is all useful matter to architectural students, as also is a brief discussion of the effects of friction, which forms the conclusion of the treatise. Although the work is of elementary character, it is thoughtfully written and should serve to give a generally sound basis for the addition of further knowledge. It is illustrated by numerous diagrams and a series of five excellent double-page plates at the end; but we are sorry to observe that that most useful detail—an index—has been entirely omitted.

The Eighteenth-Century Architecture of Bath. Part I. By MOWBRAY A. GREEN, A.R.I.B.A. Bath: George Gregory. 1902.

THERE is a custom prevalent in the offices of certain publishers of which the first part of the above work furnishes a good example. We refer to the course quite usually taken when publishing a book in parts—the issuing of the preface and introduction with the last part instead of the first. Every one can, of course, understand that to a certain degree this arrangement may be convenient to author and publisher, but to the reader it is little less than maddening, and consequently the practice would seem to be not wholly without prejudice to the general welfare of such works.

It so happens that in this case we have seen the original prospectus, otherwise we should have been at a loss to know how the subject was going to be dealt with as a whole, and whether there was any chance of obtaining answers in the later parts to the thousand and one questions which the perusal of the first forces us to ask. We are promised a hundred plates, some photographs, some measured drawings illustrating the eighteenth-century architecture of the city, and, in particular, our attention is to be drawn to the work of the two John Woods.

Now the careful description of the architecture of a certain period within a certain locality seems to us to be quite the subject of the architectural book of the future. Obviously by this method the subject can be treated in far greater detail than is possible in a his-

torical account taking us up and down the length and breadth of a country, for local information of every kind can be readily sought and the results compared with existing architectural remains.

With the eighteenth century in England for your period, and Bath, the centre of English out-of-town fashion, for your locality, what should we not expect of you? The perusal of the first part of Mr. Mowbray Green's book leaves us with the impression that our expectations are not to be realised.

The eighteenth century was one in which the arts were held dear, and whatever may be our twentieth-century opinion as to the prevailing architectural taste of those days, we cannot forget that fashionable people were then, more often than not, cultivated people in the best sense of the word, and eighteenth-century letters abound with references to the art and to the artists of the day. It would seem to us, therefore, highly inadvisable to produce a book on the buildings erected in such a place as Bath without most carefully reviewing and quoting as often as possible the letters of the day, and every local document bearing upon the subject which careful research could bring to light and decent scholarship arrange. Not only should we reasonably expect to find bills and accounts shedding light upon the trade conditions of the day, but we should rest unsatisfied did we not find somewhere in England many of the original drawings made for some of the typical works in the town. We must still hope that some such treat may be in store for us in the succeeding part of Mr. Green's book, otherwise even a studied apologia would hardly suffice to excuse the appearance of a well-intentioned but inadequate book and (if the truth must be told) a somewhat irritating literary style.

Siena: Its Architecture and Art. By GILBERT HASTINGS. London: The De La More Press. 1902.

THE above title graces but fifty-five quarto pages, fourteen of which are devoted to introductory remarks. But if we hesitate to call the little work a book we must admit it to be an excellent essay, good in substance and of a pleasant literary flavour. It comes to us at a time when we are thinking of a large and careful work dealing with Sienese art in considerable detail, a work which has quite lately appeared in England; but this sort of book does not really harm the thoughtful essay, of which the little work before us is so good an example.

Those who know something of Italian art will be interested in the way in which the Cimabue controversy is handled by the author, and every one will be delighted with his style—style in thought as well as in words. Along these few pages of smooth and elegant writing are scattered good quotable ideas pointedly expressed, as when the author speaks of the porch at the base of the great tower flanking the Palazzo Publico as "hesitatingly Gothic."

The book might well find a place in the library of serious readers; the younger student, however, must not suppose that he can use this book as an introductory treatise to his studies in Italian art.

We may, in conclusion, express pleasure at coming across the admirable examples of metal work reproduced opposite pp. 28 and 30; photographs of these justly celebrated torch-holders are not too easily obtained. We must not omit to mention the admirable printing and sensible binding, which go so far towards making the little book in every way attractive.

Old St. Paul's Cathedral. By WILLIAM BENHAM, D.D., F.S.A. London: Seeley & Co. 1902.

WHAT is the real value of a quotation in archæological or historical work? The opportunity of verifying it. It is often the case that quotations are the only passages of a book the verification of which would materially assist in the just estimate of its merits; consequently, when writers on matters of antiquarian interest fail to give proper references in footnotes or otherwhere, they not only deprive the critic of the opportunity of verifying their statements, but they withhold from the younger student that which is well within their power to impart, the knowledge of the sources from which their original information was derived, and which may yield points of amazing interest to the thoughtful and earnest reader. A fine indifference to these considerations is often enough displayed nowadays, and Canon Benham is no whit less in fault in this respect than the majority of his book-making contemporaries.

In the work before us, which is as full of information and is as nicely written as other books by the same hand, inverted commas are not infrequently met with, but are hardly ever followed by the definite, and therefore alluring, reference. Latin quotations, some of them monkish elegiacs, give a scholastic grace to the page, and the sympathetic consideration of the author has led him to append not a few decent translations. Very charming and interesting indeed are the plates scattered up and down the book, for besides attractive reproductions of illuminated but irrelevant manuscripts, which are sifted amongst the pages with a prodigality truly astounding, there are a number of the familiar prints after Hollar, always so delightful to look at.

To digress for a moment. In glancing at the view of St. Paul's Church and the City from the south side of the water (Hollar, p. 23), one cannot help wondering how many people know that the "eel ships" shown there are still represented by some such craft to-day, and how many people there are who know why.

The canon expresses in more than one paragraph his disgust at the secular use of Paul's Walk, but it is open to question whether the secular use of certain parts (particularly the nave) of some of our English cathedral churches proceeded solely from godlessness. It is sometimes held, and not without reason, that the people felt the need of using, and the Church the need of recognising, the nave as a suitable and convenient meeting place for the citizens engaged on certain secular pursuits. This idea does seem to have held to the English mind in spite of various religious checks, and we may cite as an instance the fact that college chapels were and are to this day used for certain important official but secular purposes.

On p. 10, reference is made to the frequent use of the term "pardon" in connexion with burial grounds, and Canon Benham asks the question (which we have heard asked before) "does it indicate that these particular burial grounds were bought with money paid for Indulgence or expiations?" The answer to this question is usually given in the affirmative, but there has been absolutely no definite historical evidence adduced as yet either in support or contradiction of the statement.

Some people will be interested to note the reference on p. 12 to the handing over in 1570 of a house on the south side of Paul's to the doctors of civil law as a "commons house." The history of this remarkable and unique body has yet to be properly written. Few people know that it was founded and patronised in the fourteenth century by Trinity Hall, in the University of Cambridge, for doctors of canon and civil law of both universities, and that it remained more or less as a corporate and collegiate body till a generation or two ago.

When dealing with the Chantries, Dr. Benham should not have omitted to mention the very important letter to the Dean and Chapter of St. Paul's,* wherein, after a preamble concerning a report of the Mayor and Aldermen, he says:—"We have fully understood, and also do see it daily with our own eyes when we pass by your Church of St. Paul's . . . . that there are but few chaplains to sing there in proportion to the chantries . . . . founded." They are in future to see that no chaplain undertakes the duties of more than one chantry.

There are one or two more documents which seem to us to have demanded the attention given to other and less interesting ones; but no matter. Architectural students may want some book of this kind for reference, but its interest lies not in its architectural description.

Chinese Porcelain. Vol. II. By W. G. GULLAND. With 400 Illustrations. London: Chapman & Hall. 1902.

THE first volume upon "Chinese Porcelain" appeared in 1898, and was noticed in this journal. The new volume completes a most comprehensive exposition of this remarkable industry. Chinese porcelain reflects the dynasties under whose auspices it was manufactured, for the great specimens were manufactured in royal potteries, and, like the alabaster slabs from the Assyrian palaces, they record the histories and the prowess of the reigning monarch. In the "Mille Cerf" we see the great hunting scenes of the court. Folklore and fairy-tale may be read upon a Mandarin plate. Symbolism is even wrapped up with the familiar hawthorn and magpie, which express long life and happiness. We told the story of the famous willow pattern, we remember, in our previous notice. During four centuries this remarkable art has flourished, from the trenchard bowls to the varied productions of our own day. The preservation of a great tradition, underlying the variety and change in treatment or subject, presents attractions that are independent of its artistic and decorative aspects, although it is with the latter that those who are not *connoisseurs* of this speciality are probably most concerned. The paste, the colours, the blues of the hawthorn, and the crimsons of the rose-pœony, have their admirers. But the catholic lover of porcelain has to recognise this difficulty with regard to Chinese art—it will "go" with nothing else, as Mr. Gulland admits. It will be noticed that in any miscellaneous collection this particular ware is placed formally apart by itself, especially by dealers who know their business. This caste or exclusiveness must always act as a deterrent to casual collectors, and the collector of Chinese porcelain probably collects nothing else. It is these whom the author doubtless addresses for the "catalogue" character of his work, for which he apologises, will not recommend it to the hasty reader of handbooks.

We are interested in his references to the Oriental imitation of the Lowestoft china, a matter that has been in some dispute. It has been a question whether or not certain articles, presumably from this manufactory, were in whole or in part genuine productions. Mr. Gulland decides that the faïence in dispute is wholly Chinese, and that Lowestoft was not the only style in which these imitators were adepts. The photographic plates, as the title-page sets forth, are numerous. The advances made in colour printing would have produced some very effective results and rendered the illustrations more descriptive, but, as is pointed out, a book which is to sell for a few shillings must make some sacrifices.

Picturesque Old Houses. By ALLAN FEA. With numerous Illustrations. London: S. H. Bousfield & Co.

HAD the author asked himself why these old houses were picturesque, and so been drawn into distinctions and detail, such a digression would have been not only interesting in itself, but it would have rendered the selection of his excellent quarter-plate illustrations a little more inevitable than they now appear to be. The itinerary of his wanderings is too meagre for the purpose. It is at once too unsubstantial to need the illustrations itself, and in itself it is too discursive to add to their interest. We cannot help fearing that one of the results of the increasing reliance now placed upon the evidence of the Kodak will be that the faculty of verbal description will gradually become atrophied and die out. A visit, for instance, to Compton Wynyates is thus referred to:—"To see that wonderful old house under every aspect of light and shade, and to study it from every conceivable point of view, was, to me at any rate, an enormous treat." That is all. One thinks of what has been done without the aid of illustration, of Daniel Defoe's "Tour Through the Eastern Counties," or of Dorothy Wordsworth's "Tour in the Highlands."

Nevertheless, the camera has done good work—perhaps the best work that a camera can do; that is, to put on record facts, that will cease to be facts with the process of time and improvements. Indeed, as one may see, the charming half-timber house at East Mascalls is already neglected and ruinous, and the weather will ere long complete its end, if man does not. Many of the examples are unknown to us, and we are specially indebted to the author for the views of Asthall House—so typical of an old English manor—and of Hever Castle, which might legitimately claim to be the home of romance.

* 19 Ed. III., Letter Book F, fol. ciii.

The Stellar Heavens. An Introduction to the Study of the Stars and Nebulæ. By J. ELLARD GORE, F.R.A.S. London: Chatto & Windus. 1903.

WE have often noticed Mr. Ellard Gore's excellent and useful popular articles on astronomical subjects in the pages of the *Gentleman's Magazine*. The present little book is not exactly popular, it is only rudimentary; there is no light reading in it; but it is a brief and comprehensive summary of the present state of knowledge and opinion in regard to the stars generally, and as to double and binary stars, variable stars, star clusters and nebulæ, with an outline of the principles on which the investigation into the distance and proper motion of stars is carried on. It is a very good book to give to an intelligent boy (not too young) with a turn for science; it will give him the outlines of a great subject in a concise form.

One query we would put: Why is the base in a parallax observation defined (p. 10) as the "*radius* of the earth's orbit"? If, as is usual, observations for ascertaining parallax are taken at intervals of six months, *i.e.* at two positions of the earth which are at their greatest possible distance from each other, that distance is twice the radius, or otherwise is the diameter of the earth's orbit. We seem to remember to have seen the same definition elsewhere; but if so, astronomers must use the word "radius" with a peculiar meaning of their own.

We presume that on p. 69 the sentence (about variable stars), "due to an eclipse by a dark or bright comparison" should read—"a dark or bright companion."

TRADE CATALOGUES.

WE have received from the Linolite Co., of Victoria-street, Westminster, a catalogue describing their new system of electric lighting, which seems to us well adapted for many purposes. The reflector used consists of long strips of nickled copper or highly polished aluminium, which are bent so as to form long semi-circular channels about 2¼ in. in diameter, and the edges are rolled round to form two small beads, each of which carries one of the electric wires. The lamps used are long tubular incandescent lamps about an inch in diameter, each containing a single straight filament. Hence in this system we have simply long lines of light. It takes up very little space, and is obviously very suitable for shop-window lighting, lighting for reflection from the ceiling, and outlining the outside of public buildings on special occasions. The reflectors can be installed easily, as they are sent out ready wired, so that it is only necessary to screw them into position and join the leads to the mains through a switch. The sockets for the lamps are contained in the reflector.

Messrs. Snowdon, Sons, & Co. send us a pamphlet containing a report on tests, by Professor Hudson Beare, of certain non-conducting compositions, which were applied to 3-in. steam pipe and tested under steam pressures of 80 lbs. and 45 lbs. per square inch. The various compositions were applied as nearly as possible at the same thickness, but slight variations were noticed after drying. In the opinion of Professor Hudson Beare, however, such differences are not sufficient to account to any material extent for the different weights of steam condensed. In each of the tests quoted, the asbestos composition manufactured by Messrs. Snowdon gave the most favourable results, the minimum condensation being 0·190 lb. and 0·148 lb. respectively per square foot per hour. Some further tests, made in Russia, are also quoted in the pamphlet, and the latter are interesting as affording a comparison between asbestos composition and other forms of non-conducting material. Diagrams are reproduced showing the nature of the apparatus used in the conduct of all the tests mentioned, and at the end of the pamphlet some particulars are given of the forms in which this asbestos covering is supplied.

THE INTERNATIONAL SOCIETY OF SCULPTORS, PAINTERS, AND GRAVERS.—This Society has leased the New Gallery, Regent-street, for the seasons of 1904, 5, and 6, and the Society's first exhibition in these galleries will be opened in January next. The President of the International is Mr. Whistler, and among the members of the Committee are Messrs. Guthrie, Lavery, Thaulow, Sauter, Sullivan, and Pennell.

Correspondence.

THE PUBLIC HEALTH ACTS.

SIR,—Many of the sanitary authorities in different parts of this country appear to be so well satisfied with their building by-laws, and with the interpretation put upon them by their building surveyors, that even where the right of appealing to a Health Committee by those building owners who feel aggrieved exists, it is, for all practical purposes, a useless safeguard against needless oppression.

I therefore ask the hospitality of your columns to make known some of the antiquated absurdities which seem to demand revision, and I have the greater reason for doing so since I have recently learned, through one of the Liverpool Corporation officials, that alterations are unlikely to be made in building by-laws until it is publicly shown that they are desirable. For this reason, I shall take examples from the Liverpool building by-laws, more particularly, to illustrate my remarks, but I wish to disavow the slightest intention of especial reference to Liverpool by-laws as being any more old-fashioned and pedantic than many others which I could name. The objection raised is against the whole principle upon which so many of the building by-laws of this country, as a whole, have been drafted, and which, admittedly, has the effect of doing irreparable harm to the cause of architecture, and of preventing an intelligent advance and economy in building construction.

Before citing a few examples, I desire to gratefully notice the more scientific spirit which pervades a few of the more important Corporations. These have recognised to some extent that the only practicable method of drafting by-laws is to enunciate principles, applicable to the nation as a whole and to varying localities, rather than to attempt an inventory of building construction, and that building by-laws should be constantly revised so that they may always be applicable to present-time needs and modern inventions. Only in such way can there be that progress and economy in building which marks the practice of engineering.

Glasgow, for example, has a by-law which reads as follows:—

"71. (1) (*a*) All new buildings erected for use as dwelling-houses, halls, schools, churches, theatres, music-halls, places for public meetings, and warehouses, stores, factories, and workshops; and (*b*) all buildings, whether erected before or after the passing of this Act, which may hereafter be altered or adapted for use as aforesaid, shall be of sufficient strength and shall be designed and constructed so that the completed structure shall, in addition to the weight of the materials of which it is composed, be able to carry as a safe load the following minimum weights, viz.:—

Dwelling-houses 100 lbs. per square foot of floor;

Halls, schools, churches, theatres, music-halls, and places for public meetings, 180 lbs. per square foot of floor;

Warehouses, stores, factories, and workshops, 224 lbs. per square foot of floor.

For the purposes of this Part of this Act, a safe load upon timber shall be held to be one-seventh, upon wrought-iron one-fourth, and upon cast-iron one-sixth of the breaking strain."

A scientific and progressive compliance with the above by-law should not be beyond the inventiveness of architects to devise in more than one stereotyped pattern, nor should it pass the skill of building surveyors to scientifically prove the sufficiency of the construction proposed.

The opposite system (and upon which the Liverpool by-laws are drafted) has not unfrequently placed many Sanitary Authorities throughout the kingdom in the most ludicrous positions; and the Local Government Board have so far recognised this that they have recently drafted amended model by-laws, which local authorities may adopt if they desire to do so, having for their object the cheapening of building in country districts hitherto required to be in accordance with regulations primarily intended to apply to buildings erected in a crowded city. But it is to be regretted that some Sanitary Authorities seem to make it a point of honour to sustain their by-laws, if once passed, against all objections raised by building owners, and even against the recommendations of the Local Government Board themselves, as though any criticism thereof were a reflection upon their own perspicacity. So much is this the case, that I have even found some persons, builders and others, who seemed to doubt whether this is really a free country, where, happily, the right to hold and express opinion is not always attended by dire consequences. The chief difficulty in such cases seems to be to induce sanitary authorities to realise that it is impossible for even the most versatile and far-seeing building surveyor to preconceive all the ideas of adaptations of building construction to architecture which the building community may find desirable; and that it is not practicable to draft a number of irrevocable "positive" by-laws which shall fit every case which human necessities and ingenuity may, respectively, require and evolve.

In selecting a few examples from the Liverpool Building by-laws in illustration of the purport of building by-laws generally, I scarcely know which to cite, for each seems more interesting than the other. The following will, however, suffice as typical of the whole:—

LXXIX. (3. Amended).—Relating to the Setting Back of Window-Frames, 4½ in. from the External Face of the Wall.

This by-law was drafted, as I understand, to prevent window openings being constructed without an external arch, head or lintel; and the better avoidance of damage by fire was thereby intended. But how this by-law would prevent the wood lintel at rear of the window frame, and which possibly embraces seven-eighths of the entire thickness of the wall, from being consumed by fire, seems unexplainable; and, similarly, the insistence upon a wood lintel being provided would surely not secure, as a consequence, the provision of a relieving arch over the lintel, which alone would be of use in case of fire. The by-law would be of no practical use for the alleged purpose in view, and has the effect of preventing a pleasing form of window from being erected which has the merits of allowing more light to enter the apartment and of affording convenient internal space. Moreover, in Manchester, Wirral, Chester, and elsewhere, such a by-law does not appertain, and I have not heard that those places suffer more from fires upon that account than does Liverpool. In any case, it should not be impossible to devise other and better ways of meeting the evil, did it exist, which would permit of greater building ingenuity and resource.

Under this same by-law, the Corporation reserve power to sanction, on application to them, the unconstructional and reprehensible method of imitating half-timberwork walls by affixing timber to brick walls which are already the required thickness; but the sound construction of half-timberwork walling is not permitted to count as part of the walling. Surely this is not an encouragement to sound building.

LXXIII. (I.) (II.) (III.) (IV.) (V.).—Relating to Footings.

Footings, presumably, are intended to distribute the weight of a wall over a wider area than itself, to allow for the less resistance of a softer material; yet the same width of footings is required, whatever may be the nature of the foundation supporting the wall, and I have known of demands being made for the regulation footings to a wall which rested upon solid rock.

Schedule B.—Relating to Timbers for Floors.

Should the bearings of a joist exceed by even half an inch a certain specified length, the strength of the scantling has then to be increased, according to the by-laws, sufficiently to sustain an increased bearing of 2 ft., *i.e.*, 2¾ in. more than exists. Again, should it be desired to construct a floor or roof in a manner, or of materials, different from that referred to in the building by-laws, compliance with the building surveyor's individual opinion, the principle of which is previously unknown, is demanded, instead of there being a recognised principle of strength which could be complied with in a manner and with materials duly determined by calculations made upon the basis of accepted formulæ.

LXXXI.—Relating to Support of External Walls over Openings.

A single opening of less than 6 ft. span must not be bridged by timber alone to support the external wall over same; yet an unlimited and continuous series of openings of as much as 10 ft. span each may be so bridged for such purpose. Moreover, a single opening of a span of (say) 10 ft. 0½ in. cannot be bridged by timber alone, but must have in addition a story post, which would reduce the clear span to less than 5 ft. (allowing for the width of the head of the story post)—*i.e.*, to less than the minimum span of 6 ft. which has been previously, in the same by-law, prescribed.

CI. (3).—Relating to Size of Flues.

Every flue, for whatever purpose, must be 14 in by 9 in., although the chimney-pots completing them may be only 7 in. in diameter. This reminder of old days, when boys climbed flues to sweep them, and when flues were designed with this view rather than the effective passage of smoke, probably explains nine-tenths of the smoky chimneys which exist, by checking the force of the draught.

L.C.A., 1902.—Clause 39.—Relating to Fixed Dust-Boxes.

Last year the Liverpool Corporation spent 18,000*l.* in abolishing 14,000 ash-pits. Yet by Act of Parliament they have now taken power to compel occupiers to use fixed dust-boxes instead of moveable ash-bins; and when a moveable ash-bin has been indicated upon submitted drawings, demand has been made for the construction of an ash-pit instead thereof.

LV. (1), (2), (3).—Relating to the Deposit of Plans.

Although there is no power conferred upon him by the by-laws to do so, the City Building Surveyor arbitrarily claims to dictate the quality of paper, the kind of ink, the colours, and the method adopted in the preparation of the drawings. A case might be cited where consideration of submitted drawings was deliberately delayed because the size of the printing was required to be in 1 in. instead of ¼ in. deep letters. The by-law specifically states the information concerning the proposed building which the drawings must contain, yet further in-

formation is arbitrarily demanded (and delay deliberately caused until it is furnished), such as the endorsement of a stable as "not a dwelling-house," although the fact is obvious.

CXIX.—Relating to Party Walls.

The application of this by-law appears to be at the pleasure of the Corporation, although there is no power for them to exercise discretion in regard thereto provided for in the by-laws. For instance, a particular occupier, who could be named, has been permitted to cut away the party wall to enlarge the shop-window in one of his shops, but in another shop, when he did the same thing, a summons against it was served by the Corporation.

Instances innumerable might be cited showing the illogical and arbitrary nature and application of the Liverpool by-laws; and contrasts might be made between the condemnation and enforced removal of pavement areas and shop-fronts which projected ¼ in. to ½ in. beyond the regulation distance, and of walls two-thirds of their regulation thickness being allowed to remain. But perhaps the best condemnation of the Liverpool By-laws is contained in the fact that when the Corporation, under the Housing Acts, commenced to build themselves, they found out the impracticability of complying with their own by-laws, and so forthwith obtained an Act of Parliament enabling them to ignore their by-laws.

One other point deserves notice. All cases under the Liverpool Building By-laws are taken before the stipendiary magistrate, who, however impartial he may endeavour to be, is clearly not a fit and proper person to adjudicate in cases where the Corporation is the prosecutor. In the London Building Act this cardinal principle of fairness is rightly recognised, and the *personnel* of the Tribunal of Appeal under the Act—and before whom appeals against decisions under that Act may be taken—expressly excludes members or officers of the London County Council from acting thereon.

The cause of all the trouble in respect of building by-laws appears to be the attempt to adapt in piece-meal fashion a set of so-called "model by-laws," drafted shortly after the passing of the Public Health Act of 1875, to the various necessities of hundreds of Sanitary Authorities as occasion seems to demand. In the result, the building by-laws of to-day, some quarter of a century since the passing of the above Act, present a hopeless entanglement of incongruities and inconsistencies, and—whilst frequently placing the authorities who have to administer them in illogical and unenviable positions—offer but little assistance to those who desire to ensure sound buildings. On the one hand, it is undignified for a Sanitary Authority to need to excuse an obvious incongruity by the explanation that "it is according to the by-laws;" and, on the other hand, it would be helpful to the building community were scientific assistance offered them by the by-laws in the sound construction of buildings. Again, on the one hand, it surely does not promote respect for the by-laws by the building community to know that buildings sanctioned in one place as safe and sanitary, would elsewhere be condemned as dangerous and unhealthy, though, perhaps, only the width of a street or of a river separated the two districts; or that the obvious meaning and intention of a by-law should be perverted and twisted so that the by-law might be made to apply to a new and unlooked-for case in the hope that it would be not worth a building-owner's while to dispute an obvious incongruity; whilst, on the other hand, of how very much greater use the by-laws would be were they to offer assistance as to the principles to be adopted in deciding the form and strength of a truss, for example, which there might be some difficulty in determining for a particular situation, instead of stipulating the strength of a purlin, the calculation for which is simplicity itself.

It has been contended, I believe, that the usual rough and ready, and decidedly unscientific, drafting of building by-laws is due to the alleged ignorance of builders who, were they required to build in compliance with accepted formulæ and co-efficients propounded by scientists, such as Molesworth, Hurst, Rankine, and so on, would be unable to comprehend the meaning of the requirements of the authorities. Another view is that an unscientific drafting of by-laws not only saves trouble to building surveyors, but permits of persons without previous training and experience as architects and engineers occupying positions in authority over architects and engineers for which, by their training, they have not been specially fitted.

May one hope that the Building Surveyors of the United Kingdom, will, admitting "the necessity for the re-construction and consolidation of the Public Health Acts," join with architects in evolving rational building by-laws which would be a credit, instead of a reproach, to the common sense and wit of Englishmen.

T. MYDDELTON SHALLCROSS.

Liverpool, April 20.

THE VENTILATION OF SCHOOLS.

SIR,—Whilst not in accord with those who recommend the "Plenum" system I do not wish to discuss it here and now; but I am quite in agreement with "R. W. S" in deprecating the warming of buildings by means of heated air at comparatively high temperatures. More especially is the effect pernicious in cases of intermittent warming, as in churches, when the air is warmed and the walls and other surfaces remain cold, so that, notwithstanding that highly warmed air is breathed, yet heat radiates from the body to the cold walls and surfaces. The exact opposite should be the condition to endeavour to achieve. "R. W. S.," in his letter in your last issue at p. 417, writes of warming the air by steam, enclosed in pipes or vessels, at temperatures from 259 deg. to 274 deg. Fahr., and observes that steam at such temperatures deprives the air of much of its oxygen. Will he kindly follow on, and say what becomes of the oxygen? Granting that the oxygen cannot be destroyed, it must combine with something else, so that there must be deprivation of some other constituent, either of the air or building or apparatus, to be guarded against. But is it really true that warming the air deprives it of its oxygen instead of merely raising the temperature of the latter without eliminating it?

A. H.

QUANTITY SURVEYORS' ASSOCIATION.

SIR,—As one of those present at the preliminary meeting when the question of the formation of the above was under discussion, will you allow me (without wishing to lengthen out to the voluminous correspondence this movement has entailed) to endorse Mr. Hoffmann Wood's statement in your issue of last week, that the wording of the circular (to which Mr. Leaning takes such exception) was not solely due to Mr. Wood, but was the joint production of all those present after the matter had been fully considered.

However much Mr. Leaning may differ from us upon a question of policy and expediency, the course he adopts in making personal attacks is one to be deprecated by all the members of the profession, and is hardly likely to commend itself to the Council of that very Institution (the Surveyors') whose cause he so ardently espouses.

ARTHUR G. CROSS.

RE MAIDENHEAD FREE LIBRARY.

SIR,—Will you kindly allow me, through the medium of your paper, to call the attention of the Assessor in the open competition for the above to the construction placed upon the following clause by the local Borough Surveyor, to whom all questions are referred by the Town Clerk?—

"18. A period of one month from the 16th day of March, 1903, will be allowed to address questions to the Town Clerk on the competition. At the end of this period a copy of such of these questions and the answers thereto as appear desirable, will be furnished to every competitor, and all designs will be required to reach the Town Clerk by the 30th day of May, 1903."

He claimed that the above clause prohibited him from answering questions until the month from March 16 had elapsed.

It is now April 22, and no answers have yet been received.

A COMPETITOR.

BOOKS RECEIVED.

THE STELLAR HEAVENS. By J. Ellard Gore, F.R.A.S. (Chatto & Windus.)

GENERAL BUILDING NEWS.

INDEPENDENT CHURCH, ILKESTON.—It is proposed to erect a new Independent church at Ilkeston, from plans prepared by Mr. H. Tatham Sudbury, architect, Ilkeston. The site is at the juncture of Wharncliffe-road and Albert-street.

CHURCH EXTENSION, BLYTH.—The new extensions at the parish church of St. Mary's, Waterloo, Blyth, were dedicated on the 14th inst. The extensions consist of a new north aisle and additions to the western portion of the edifice. The enlargement was carried out by Messrs. Carse, contractors, Amble, from the plans of Messrs. Hicks and Charlewood, architects.

PRIMITIVE METHODIST CHURCH, MATLOCK.—The foundation stones were laid on the 13th inst. of a new Primitive Methodist church on Matlock Moor. The building is to be Gothic in style. The architect is Mr. D. M. Wildgoose, and Mr. J. W. Wildgoose is the contractor.

CHAPEL, OULTON, NORFOLK.—A new Primitive Methodist church is being erected at Oulton by Mr. J. S. Youngs, of Oulton, from plans by Mr. F. W. Richards, architect, Lowestoft. The chapel will seat 300 persons, and will be 40 ft. long and 28 ft. wide inside, 14 ft. high at the plate, and 21 ft. from ceiling to floor.

CHURCH ALTERATIONS, BRIGHOUSE.—Mr. C. H. Fowler, architect, of Durham, has prepared plans for the improvement and enlargement of Brighouse Parish Church. The chief feature of the proposed alteration is an enlarged chancel. In addition to this, the present ceiling of the church is to be removed and open-timbered rafters substituted, whilst the organ is to be removed from the west to the east end. Contracts have been let for the execution of the work, amounting to about 4,000*l.*

EPISCOPAL CHURCH, LOCKERBIE, NEAR GLASGOW.—The new Episcopal Church at Lockerbie, which has been built at a cost of about 2,000*l.*, was opened on the 18th inst. The church is erected in Ashgrove-terrace, practically a new suburb of the town, from plans prepared by Mr. John Douglas, Chester. The building is of red sandstone and is Early English in style.

RESTORATION OF ROWSTON CHURCH, LINCOLNSHIRE.—The Parish Church at Rowston, near Digby, was re-opened recently after restoration. Previous to the restoration the chancel arch had entirely disappeared, and the whole of the east wall of the nave was occupied by a large painting down to within 8 ft. of the floor. The painting represented a classical arcade, above which was a rendering of the Royal arms of George II. The spaces in the lower portion were occupied by panels bearing the Lord's Prayer, the ten Commandments, and the Apostles' Creed. The roof immediately above was boarded in and painted with a design of cherubs' heads floating in clouds, among which appeared the Hebrew characters for Jehovah. The whole of this painting has been refixed elsewhere upon the church walls, and the chancel once more opened out into the nave by a new chancel arch. The flat ceiling of the chancel has been replaced by an open timbered roof in oak, and a group of "triple lancets" has been pierced through the east wall. The dilapidated roof of the north aisle has been replaced by a new open timbered roof, and in each case the old tiles have been carefully relaid upon the new roofs. The whole of the floors have been taken up and relaid upon a concrete foundation, stone being used for the aisles and chancel, and wood blocks beneath the pews, while new pews, choir stalls, inner porch and screenwork, all executed in oak, have been provided. The tower arch has also been opened out into the nave and provided with a new ringing floor. Outside, the earth has been lowered down to the floor line, the debased porch, which entirely hid the Early English doorway, removed, and two new buttresses erected to prop up the failing south wall. The churchyard has been provided with new entrance gates. The east windows have been filled with stained glass by Mr. A. O. Hemming, the three lights representing the Resurrection, the Crucifixion, and the Ascension. The architects for the work have been Messrs. W. Watkins & Son, of Lincoln, and the contractor, Mr. Frank Pattinson, of Ruskington.—*Lincolnshire Echo.*

WESLEYAN CHURCH, CAYTON, YORKSHIRE.—The foundation and memorial stones of a new Wesleyan Church were laid at Cayton recently. The new church is to provide accommodation for 150, and for 100 scholars in the Sunday school. The architect is Mr. E. Simpson (Scarborough), and Mr. A. Coultas (Scarborough) is the contractor. The estimated cost is 1,200*l.*

MISSION HALL, SUNDERLAND.—The Bishop of Richmond opened and dedicated the hall of the new mission buildings that are being erected in Wilson-street, Sunderland, on the 14th inst. The hall, which is the only portion of the scheme yet completed, has cost about 930*l.* It will accommodate some 160 people. The part of the scheme which remains to be executed comprises four classrooms in a two-storied building, and the carrying out of this work will provide the hall with a gallery to hold about forty-five people. The total cost of the scheme will be about 1,250*l.* The architects are Messrs. Joseph Potts & Son, Sunderland; and the contractor, Mr. James Armitage, Southwick.

SCHOOLS, MANSFIELD.—The block of schools which has been erected in Berry Hill-road, Mansfield, by the Mansfield School Board, was opened on the 15th inst. The buildings consist of a mixed school for boys and girls and a separate block for infants. The mixed department consists of an assembly hall 52 ft. by 32 ft. 6 in., and seven classrooms, each 25 ft. by 24 ft., the whole giving accommodation to 540 boys and girls. There are also masters' and teachers' rooms and other apartments. The infants' block comprises five classrooms, each 24 ft. by 21 ft,, and a babies' room, 21 ft. by 20 ft., affording accommodation for 350 children. All the classrooms are arranged round the central hall. The buildings were erected from designs by Messrs. Vallance & Westwick, by Mr. John Greenwood, at a contract price of 11,200*l.*

CATTLE MARKET, MARKET HARBOROUGH.—The new cattle market was opened at Market Harborough recently. The entire cost of the new market, inclusive of site, will, it is estimated, amount to over 26,000*l.* The market is situated on the main road to Northampton, on the western boundary, and the main road to Kettering on the eastern. Mr. Herbert Coales is the engineer of the scheme.

LIBRARY, WAVERTREE, LIVERPOOL.—A new library and reading-rooms have been erected on the south side of Picton-road, Wavertree. The building stands back some 40 ft. The materials employed are red pressed bricks and Cefn stone, the roofs being covered with Green Westmorland slates. The main entrance is from the centre of the building. Entering through this door, the visitor finds himself in a capacious common vestibule. To the right hand is the gentlemen's reading-room, whilst to the left hand is the boys' reading-room; the ladies' reading-room is immediately behind the boys' room, and has a separate entrance. The lending department is opposite the inner central door of the vestibule. In the basement are the assistants' rooms, storerooms, and lavatories for the staff. The main reading-room is 47 ft. by 26 ft 6 in. The

vestibule and reading-room walls are lined with a green dado, and the pavement of the vestibule is of white marble mosaic, surrounded and divided by black marble strips. Mr. Thomas Shelmerdine, the Corporation Surveyor, has superintended the designing and carrying out of the work. The cost of buildings and furnishings will be 8,000*l.*

POOR-LAW HOSPITAL EXTENSION, WITHINGTON, LANCASHIRE.—The foundation-stones were laid on the 14th inst. of two new hospital pavilions and an annexe to the Nurses' Home at the workhouse of the Chorlton Union at Withington. The infirmary accommodation is at present inadequate, and the Board of Guardians have recently obtained permission to borrow 33,920*l.* for purposes of extension. Mr. J. B. Broadbent, of Manchester, is the architect of the new buildings, and Mr. R. Carlyle is the general contractor. The pavilions, when complete, will practically make a new infirmary, which, with the existing hospital, will accommodate some 1,600 patients. The pavilions will have thirty-two beds on each of three floors. The surgical ward will contain thirteen beds, and altogether the number of beds provided is 205. The Nurses' Home provides for the present and for the future requirements of the nursing staff of the workhouse infirmary, and it is to be built on the single-corridor plan. There will be accommodation for forty-nine nurses and ten servants, or for fifty-five nurses if the servants are housed elsewhere. The cost of the home is put down at 7,400*l.*, and that of the two pavilions at 25,300*l.*

RAILWAY OFFICES, MIDDLESBROUGH. — The North-Eastern Railway Co. have lately erected a block of offices in Middlesbrough. A site closely adjoining both the railway and the docks was obtained by clearing a block of cottages, forming an acute angle at the corner of Dock-street and Grey-street, upon which the company erected a building four stories in height, the ground floor being raised about 3 ft. above the street level. The ground floor consists of a large room used for meetings and interviews, two offices arranged *en suite* for the docks department—one for estate work, and one for the district superintendent of the railway. The first floor contains five rooms for the district superintendent, and two for the use of the engineer to the docks. The second floor consists of suites of offices, which may be used for the future extension of any of the departments, or for letting to independent tenants. The third floor is arranged into rooms for storage or lumber. A room is specially provided on the ground floor for the range of telephones used in the several departments. The main entrance doorway is from Dock-street, and is about the centre of the façade; the vestibule is about 9 ft. wide and gives access to the main staircase, and the corridors, which run the whole length of the building on each floor, are about 8 ft. in width. The main entrance doors and the vestibule screen are of polished oak. The flooring of the entrance and the corridors is of concrete, faced with cement. The staircase is constructed of stone, with metal balustrade, hard wood polished handrails. The building is lighted throughout by electricity supplied from the generating station of the company, the work having been carried out by Messrs. Graham Bros., of Middlesbrough. The lavatories have Bunsen gas-burners as a provision against frost in severe weather. The building is of brick and terra-cotta throughout, from the works of the Burmantofts Co., Ltd. The design of the building was prepared by Mr. Wm. Bell, the architect to the North-Eastern Railway Co.; and the contractor for the work was Mr. H. Barry, of Scarborough.

SCHOOL BOARD OFFICES, NEWCASTLE.—The new offices of the Newcastle School Board, Northumberland-road, adjoin the new School of Cookery, and have a frontage in the Renaissance style. The architect is Mr. W. H. Knowles, the building was erected by Messrs. Lowery, of Newcastle, and the cost is about 12,000*l.* There is a flight of steps to the entrance and a porch. The main hall is floored with marble, and from this a square staircase leads to the apartments above. In the basement are store rooms and a strong room for books and documents. On the ground floor, on either hand of the doorway, are an inspectors' room and a private room for the chief clerk. Adjoining is a clerks' room, and at the rear a general room for inquiries and other business. This apartment is fitted with a book lift which runs from the basement to the top of the building. To the rear of the inspectors' room is another lift for the use of the caretaker, and beyond that a room for the Board's clerk of works. On the upstairs floor—the staircase being lighted by a north window in coloured glass—are the rooms for members' use. The fitments of the Board-room are in dark oak, the carving having been executed by Mr. Ralph Hedley. The teachers' centre is a three-story building at the rear, and is reached by a side passage through the eastern side of the offices.

BOARD SCHOOLS, BENWELL.—The new Board schools erected in Canning-street, New Benwell, were opened on the 18th inst. The schools, which occupy an acre and a quarter of ground, have been built at a total cost of 15,559*l.* 3s. 2d., accommodation being provided for 1,474 children. The buildings are erected on the central-hall principle. There are three departments, namely, infants', juniors', and seniors'. At the south end of the schools is a room which is adapted as a centre for cookery and laundry work for the different schools under the Benwell Board. Two new features have been introduced in the seniors' department. One room is furnished with dark blinds so that geography may be taught with lime-light illustrations, and another is fitted up as a sort of laboratory, to be used for the teaching of mechanics and the carrying out of simple chemical experiments. Mr. J. W. Thompson is the architect for the buildings.

SCHOOL, BERWICK.—On the 18th inst. a new infant school, built by the School Board, was opened at Berwick. The new school is situated to the west of the old Bell Tower on a site which formerly formed part of the old town wall, very little of which is now left standing. It is a rectangular block, the maximum space being allotted for five classrooms, with central hall suitable for public meetings, &c. There are also teachers' and cloak rooms, book-store, and other conveniences. The cost of the school was about 4,300*l.* The architects were Messrs. Nicholson & Dotchin, Newcastle-on-Tyne.

THE BALTIC EXCHANGE, CITY.—The new Baltic Mercantile and Shipping Exchange, St. Mary-axe, was opened by the Lord Mayor on Tuesday. The building is erected on the site of Jeffrey-square, and occupies an area of about an acre. The large hall on the ground floor is 152 ft. in length, 136 ft. wide, and has a height of 30 ft. from floor to ceiling. It is approached from St. Mary axe through a long vestibule. This latter is finished throughout with grey and white marble, and has a range of detached marble columns on either side. The windows are of painted glass, illustrated with the arms of the leading City Companies and the principal ports of the United Kingdom. The whole of the walls and the supporting columns in the main hall are finished with marble, which has been employed largely in the interior establishment of the building. On the first floor is a reading-room for the use of members, while underneath and at the end next Bury-street are post and telegraph and telephone offices. In the basement are located dining-rooms, smoking-rooms, and auction and arbitration rooms. Above the main hall are four floors of offices, with entrances in St. Mary-axe and Bury-street. The whole of the exterior front in St. Mary-axe as high as the first floor is of polished Norwegian granite, designed in the free Renaissance style. From this floor rises a series of polished granite columns with carved capitals surmounted by a pediment, on which rests a sculptured group representing Britannia, Neptune, and Ceres. The building was erected by Messrs. George Trollope & Sons, from the designs of Mr. T. H. Smith.

SANITARY AND ENGINEERING NEWS.

EXTENSION OF CORPORATION WATERWORKS, AYR.—The inauguration of recent extensions of Ayr Corporation Waterworks at Carcluie and Knockjarder took place on the 16th inst. The Corporation obtained Parliamentary powers in August, 1899, to supplement the water supply to the burgh by the pumping of the water in the Carcluie reservoirs to Knockjarder, and the construction of a service reservoir there. Under this scheme, the old waterworks at Milton, Grange, and Carcluie belonging to the Corporation, which have been practically out of use for seventeen years, are now utilised. The storage capacity of the reservoirs at Carcluie is as follows:—No. 1, 13,000,000 gallons; No. 2, 21,000,000 gallons. The water to be pumped is mostly taken from reservoir No. 2, the eastern embankment of which has been reconstructed. The two reservoirs have been connected by forming a junction between the two original outlet-pipes. This allows of the upper 10 ft. 6 in. of water, amounting to about 7,000,000 gallons, of reservoir No. 1 being run into reservoir No. 2, making the total quantity available for pumping to Knockjarder 25,000,000 gallons. The service reservoir is 300 ft. in diameter, averages 17 ft. 6 in. deep, and contains, when full, about 7,000,000 gallons. The whole works have been carried out during ten different contracts, at a total cost of about 34,000*l.* The works were carried out under the direction of Mr. John Young, Corporation Water Engineer, with Mr. P. I. Whitton as assistant engineer, and Mr. William Kelso as inspector of works.

WATERWORKS, PRESTATYN.—The new waterworks of Prestatyn Urban Council have just been opened by Mr. Henry Duncan M'Laren. The old works were purchased from Lady M'Laren and reconstructed by Messrs. Beloe & Priest, engineers, Liverpool, the contractor being Mr. Carder Penkridge, Staffordshire. The water is obtained from natural springs in the mountains, nearly 400 ft. above sea level.

FOREIGN.

FRANCE.—A curious exhibition of Mahommedan art has been opened at the Pavillon Marsan of the Louvre. It occupies the first floor of the Musée des Arts Décoratifs, and includes about a thousand objects.——In the early part of May the monument to Ferdinand Fabre is to be inaugurated. It stands on one of the lawns near the nursery-garden of the Luxembourg. It consists of a bust of Fabre surmounting a stele beside which is a figure of a Languedoc shepherdess.——M. Ernest Dubois, the sculptor, has completed the monument to Bossuet which is to be erected at Meaux. The figure of the great preacher is represented standing and in an attitude of energetic declamation; around the pedestal are grouped the figures of the Dauphin, Henrietta of England, Mme. de Vallière, and Turenne. On the rear face of the pedestal is a medallion portrait of Condé.——A new bridge over the Oise was opened on Sunday last at Ribacourt, near Montmacq.——The Municipal Council of Grenoble has decided to erect on the Place Victor Hugo a statue of Berlioz, a replica of the one by M. Bastel at the Museum of Grenoble.——M. Noguès, the Municipal Architect of Bagnères-de-Bigorre, has been commissioned to prepare plans for a new hospital for that town, to be carried out immediately.——The town of Blois has voted a sum of 400,000 francs for the erection of an Institution to be called L'Ecole Victor Hugo.——The seventieth Archæological Congress of France will be held at Poitiers, from June 16 to 18.——The death is announced, at the age of seventy-eight, of the painter Louis Schutzenberger, who was a pupil of Paul Delaroche and of Gleyre. He received medals in the Salons of 1850, 1861, and 1863, and the Legion of Honour in 1869. He excelled especially in depicting scenes of Alsatian life.

INDIA.—The large passenger station now being erected at the Mooltan Cantonment, on the North-Western Railway, is expected to be completed within the next two months.——A new circuit house is about to be erected at Asansol at a cost of 28,000 rupees.——The electric works syndicate at Mandalay is about to erect a large power station near the railway station in that city.——The Gaekwar of Baroda has ordered the construction of a mono railway between Chital and Amreli.——Mr. G. C. Buchanan's scheme, estimated to cost 92½ lakhs of rupees, has been sanctioned, and is now being put into operation for the improvement and extension of the port of Rangoon.——It is proposed to double the line between Insein and Letpadan, on the Prome section of the Burma Railway, a distance of seventy-eight miles.——Up to the present time very few metalled roads have been made in Burma, but a considerable improvement is about to be effected in that direction.——Electric tramways are about to be constructed in Nagpur; the work will probably be let to a firm of Bombay contractors.——Sir Lawrence Jenkins, the Chief Justice of Bombay, has recently opened three new blocks of model dwelling-houses for poor Parsees at Tardeo. The houses were erected at the expense of rich Parsees in Bombay for the purpose of ameliorating the sanitary and other conditions of the more congested parts of the city.——Indian patent stone, which has been so successfully employed on military railway station platforms, is now being used in the neighbourhood of Government House, Calcutta.——Large steel and cartridge metal rolling mills are to be constructed at Ishapur, at an estimated cost of fifteen lakhs of rupees.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. E. Greenop, architect, has removed his offices from 5, Quality-court, Chancery-lane, to Falcon-court, 32, Fleet-street.——Mr. E. Shield, of Messrs. Law, Allen & Shield, architects, 5, Arundel-street, Strand, has dissolved partnership with Messrs. Law & Allen, and removed to a new office at 5, Maddox-street, W.——Mr. G. H. Paine, architect, has removed from 6, Stoke Newington-road, to 62, Moorgate-street, E.C.

PRESENTATION TO CONTRACTORS BY THEIR STAFF.—The staff of Messrs. Holliday & Greenwood, contractors, of Brixton, entertained Mr. James S. Holliday and Mr. Benjamin I. Greenwood to a dinner on Wednesday evening, the 22nd inst., at the Bridge House Hotel, and made them each a presentation of a handsome three-folding oak-framed illuminated address with plush back, and their monograms and photographs, in commemoration of their twenty-first anniversary of partnership in business. Mr. Charles Phillips, a director of the company, presided, and after the usual loyal toast was duly honoured, he asked the acceptance of both Mr. Holliday and Mr. Greenwood of the addresses, as a mark of the high regard and esteem in which the staff held them. Both partners thanked the staff for their kindness in presenting them with such beautiful testimonials, and hoped that they might be spared long to still be associated with them. Mr. Holliday, in proposing the toast of "The Staff," referred in very kind terms to the amicable relationship which had always existed, and sincerely hoped that it would be maintained.

MEMORIAL WINDOW, ST. NICHOLAS' CATHEDRAL, NEWCASTLE.—This window has been placed in St. Nicholas' Cathedral, Newcastle, to perpetuate the memory of the men of the Northumberland and Durham Imperial Yeomanry who fell during the late war, and as a recognition of the services of those of the regiment who served in the campaign. The principal part of the memorial is a three-light stained-glass window which is placed in the north aisle between similar memorials to the Northumberland Fusiliers and the local Volunteer Service sections. Measuring 14 ft. by 6 ft., the window has been executed by Messrs. Percy Bacon & Brothers,

of London. The window is divided into three compartments or lights, each of which bears a representation of an historical figure as the main treatment, with an angel in a subsidiary position. A brass tablet with the names of the ninety-four men who fell during the war is included in the memorial.

SWANSEA CASTLE.—It is announced that by the carrying out of some proposed public improvements the ruins of Swansea Castle are threatened with demolition. The castle, distinguished by its massive tower, was built in the reign of Henry I. by Henry Beaumont, Earl of Warwick, after his conquest of the lordship of Gower, when he fortified the town. The arcading is a relic of the time of Bishop Gower, and is similar to the fourteenth-century Decorated work he also carried out in the church, and in the episcopal palaces at Lamphey, near Pembroke, and at St. David's. For the latter, so characteristic of his work, compare the view after a water-colour drawing by Mr. T. G. Jackson, published in the *Builder* of December 3, 1892, showing in the foreground the courtyard and ruins of Bishop Gower's palace.

THE CHARITY COMMISSION.—The business of the Charity Commissioners was transferred on Monday from Gwydyr House, Whitehall, to Ryder-street, St. James's. The new offices, lately vacated as the Marlborough Hotel, were erected by Messrs. John Bennett & Co., contractors, in 1897-8, on the site of Nos. 12 and 14, Ryder-street, and No. 12 and "Ramsay's" Hotel in Bury-street, after plans and designs by Mr. G. D. Martin. Gwydyr House, built in what had been the Privy Garden of Whitehall Palace, was the first home of the Reform Club, established there in 1832. It was afterwards taken for the Local Government Board, and during some years past has been occupied by the Charity Commissioners.

LONDON GEOLOGICAL FIELD CLASS. — The Saturday afternoon excursions of this class, conducted by Professor H. G. Seeley, F.R.S., will commence on April 25. Amongst the localities to be visited this season will be Walton-on-the-Hill, Aylesbury, Harefield, Sevenoaks, Leighton, and Tunbridge Wells. Further particulars can be obtained from the Hon. Sec., Mr. R. Herbert Bentley, 33, Church-crescent, Muswell Hill, N.

INCORPORATED SOCIETY FOR PROMOTING THE ENLARGEMENT, BUILDING, AND REPAIRING OF CHURCHES AND CHAPELS.—This Society held its usual monthly meeting, on the 16th inst., at the Society's house, 7, Dean's-yard, Westminster Abbey, S.W. The Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz., building new churches at Eastbourne, St. Philip, Sussex, 200*l.*; Foulridge, St. Michael and All Angels, near Colne, Lancs., 55*l.*; and Stoughton, Emmanuel, near Guildford, 70*l.* in lieu of a former grant of 60*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Astley, St. Peter, Stourport, 40*l.*; Battersea, St. Mary-le-Park, Surrey, 50*l.*, making in all 150*l.*; Seighford, St. Chad, Stafford, 15*l.*; and Sydling, St. Nicholas, near Dorchester, 10*l.* The following grants were also paid for works completed: Llandwywe, St. Dwywe, Merioneth, 20*l.*; Thetford, St. Cuthbert, Norfolk, 30*l.*; and Swaffham Prior, St. Mary, near Cambridge, 130*l.* In addition to this the sum of 294*l.* was paid towards the repairs of twenty-two churches from trust funds held by the Society. The Archbishop of Canterbury, President of the Society, has announced his intention to take the chair at the annual general court to be held at the Church House on Tuesday, May 19, at 2.30 p.m.

MEMORIAL TO THE ENGINEER OF THE SEVERN TUNNEL.—A lych-gate was dedicated recently to the memory of the late Mr. T. A. Walker, the engineer for the Severn Tunnel, who was interred at Caerwent churchyard. The gate was built by Mr. Couzens, of Cardiff, from designs by Mr. Halliday, the Diocesan Architect. It is of oak, and bears a brass plate with the inscription:—"In affectionate memory of Thomas Andrew Walker, by members of his staff on the Severn Tunnel, Manchester Ship Canal, Buenos Ayres Harbour and other works. Born, 1828; died, 1889."

METROPOLITAN ASYLUMS BOARD.—A meeting of the managers of the Metropolitan Asylum District was held at the offices on the Embankment on Saturday, Sir Robert Hensley presiding. Mr. Thomas Cooper, A.M.Inst.C.E., was appointed to the post of first assistant engineer to the Board at a salary at the rate of 300*l.* per annum, in succession to Mr. Hilton Johnson, resigned. The Board accepted the tender of Mr. Henry Martin, of Northampton, for the erection for the sum of 6,467*l.*, of a home for female attendants at the Leavesden Asylum, in accordance with plans prepared by Messrs. Newman & Newman, architects. The board also approved plans prepared by Messrs. A. & C. Harston for the provision of additional accommodation, &c., at the Joyce Green Hospital at an estimated cost of 7,650*l.*

SLATERS AND TILERS' CONFERENCE, LEEDS.—The seventh triennial conference of the Amalgamated Society of Slaters and Tilers of England and Ireland Provident Society was concluded at the iUnion Tavern, Meadow-lane, Leeds, on the 17th nst. Mr. H. Parker, of Leeds, the newly-elected President, occupied the chair. The conference had been occupied since Monday in revising and amending the rules of the Society. Delegates have attended from Bishop Auckland, Carlisle, Bolton, Bradford, Bury, Dublin, Huddersfield, Leeds, Liverpool, Middlesbrough, Chesterfield, Hull, Darlington, Derby, Leicester, Manchester, Newcastle, Nottingham, North and South Shields, Stockton, Sheffield, Sunderland, West Hartlepool, and Wigan. An address was given by the Secretary of the National Association of Slate Merchants (Mr. J. Townsley, of Hull). Founded in 1882, and having its headquarters at Newcastle, the Society now has a membership of over 1,500. Some figures were presented making a comparison between last year and the previous year (1901), when trade was at a very low ebb. In 1901 the Society paid out 926*l.* in sick pay and 241*l.* in strike pay, and had a total expenditure of 1,598*l.*, or 52*l.* more than the income; whilst last year they have improved to the extent of 580*l.*, having disbursed 645*l.* in sick pay, and only 3*l.* 16*s.* in strike pay, making a total expenditure of 969*l.* According to a table prepared to show the proportionate outlay of every pound of the Society's income 9*s.* 3*d.* is spent in sick pay; 2*s.* 5*d.* in funeral benefits; and 2*s.* 7*d.* in trade benefits—including money provided for railway fares to get work and strike pay.

THE AUCTIONEERS' INSTITUTE.—The annual General Meeting of the Auctioneers' Institute of the United Kingdom will be held at the Offices, 57 and 58, Chancery-lane, London, on Thursday, May 7, 1903, at 2.30 p.m., to receive the annual report and accounts, elect members of Council and auditors, and to transact the ordinary business of the Institute. The seventeenth annual dinner of the Institute will take place at the Hotel Cecil on Thursday, May 7, at 6.30 p.m., under the presidency of Mr. John Hepper.

INTERNATIONAL FIRE BRIGADES COUNCIL.—The International Fire Brigades Council will, at the invitation of the British Fire Prevention Committee, hold its biennial meeting in London, on July 11, in connexion with the impending International Fire Prevention Congress, which opens on July 7, most of the members of the Council having expressed their intention of accepting the invitation of the Committee to attend the Congress. The Council comprises representatives of Austria-Hungary, Belgium, Denmark, France, Germany, Italy, Norway, Roumania, Russia, Spain, Switzerland, and the United States, some fifty officers in number.

BUILDING MATTERS IN PARLIAMENT.—In the discussion on the Civil Service Estimates in the House of Commons on the 21st inst., Dr. Farquharson raised a protest on the vote to complete the sum of 101,400*l.* for Royal parks and pleasure gardens, against the letting for building purposes of a narrow strip of land at the end of Palace Gardens, Kensington. With trees forming an avenue this was an agreeable place of recreation, and he feared that buildings would be erected which would wholly spoil that part of a pleasant suburb. Mr. Fellowes, interrupting, said the land in question was not under the control of the Office of Works; it did not form part of Kensington Gardens. The Chairman said it was Crown land, and was under the administration of the Office of Woods and Forests. Mr. Kearley complained of the disgraceful condition of the Birdcage-walk roadway and the annoyance caused by repairing being undertaken during Session time. Mr. Skewes-Cox asked questions in reference to the improvement of access to and from Richmond Park by Kingston Gate. Mr. Fellowes, replying to Mr. Skewes-Cox, said he had communicated with Lord Windsor, and hoped to be able to give the hon. member some information in the course of a few days. Birdcage-walk was not mended earlier on account of the autumn Session. The vote was then agreed to.—On the vote to complete the sum of 43,700*l.* for Houses of Parliament buildings, Mr. Powell Williams drew attention to the fact that a new statue of Mr. Bright had been obtained in place of the unsatisfactory statue of that statesman which was originally placed in the central lobby, but was afterwards removed. The Chairman asked whether the right hon. gentleman's point was that some site should be provided. Mr. Powell Williams: Some different site. The Chairman said that was a matter of discretion resting with the First Commissioner of Works. There was no charge in the Estimate in respect of any piece of ground upon which this statue was placed. Therefore he thought the right hon. gentleman should raise the point on the salary of the First Commissioner. Mr. Powell Williams said he would do so. Mr. R. Lucas and Mr. Macdona drew attention to the defects in the accommodation and arrangements of the House of Commons. Mr. W Redmond asked whether it was intended to carry out the recommendations of the Committee on the Accommodation of the House of Commons. After some further conversation, Mr. Fellowes said it was the intention of the First Commissioner to ask for the reappointment of the Committee which was dealing last session with the ventilation and sanitation of the House. A number of the recommendations of the Committee on House of Commons Accommodation had already been carried out; but, in view of the financial situation, the Board of Works did not feel justified in asking for the large sum which would be necessary to effect the more expensive improvements suggested by that Committee.—The votes to complete the sums of 66,120*l.* for miscellaneous legal buildings, Great Britain, and 50,150*l.* for art and science buildings, Great Britain, were agreed to.—On the vote to complete the sum of 55,500*l.* for diplomatic and consular buildings, and for the maintenance of certain cemeteries abroad, Mr. Gibson Bowles said that the Greek Government proposed to lease one of the English cemeteries in the Ionian Islands, where many distinguished Englishmen were buried, for the building of a casino. It would be an outrage if this desecration were permitted. Mr. Fellowes said that the Foreign Office were taking steps to protest against this proposal, and in a short time it was hoped that a satisfactory arrangement would be reached. The vote was agreed to.—Votes to complete the following sums were agreed to:—564,000*l.* for Inland Revenue buildings, 447,000*l.* for sundry public buildings in Great Britain not provided for on other votes, 209,010*l.* for surveys of the United Kingdom, 21,204*l.* for harbours under the Board of Trade, and 23,980*l.* for Peterhead Harbour.

CAPITAL AND LABOUR.

DISPUTES AT ST. HELENS.—A meeting of the master builders of St. Helens was held at the Raven Hotel, Church-street, on the 15th inst., when the disputes which have arisen in the building trade in the town were again under consideration. The meeting was private, but it is stated that two gentlemen were nominated to arbitrate on the dispute with the bricklayers with respect to the "walking-time" question, but they had yet to be accepted by the Bricklayers' Association. The masters refused to give any information with regard to the joiners' "lock-out," except that they were determined to adhere to their terms and not to give in. They consider that it is utterly absurd that they should be dictated to by the men, and that they should be told where to get their work done. They consider that the men have nothing to gain by continuing the "lock-out," as they have had hundreds of applications for work from joiners in various parts of the country, and it will cost the men endless expense to send them all back. "Picketing," too, they say, is illegal, and the men are liable to prosecution. Practically all the members of the Masters' Association make all their own joinery, and there are but a few who purchase "ready-made" work.

NEWCASTLE STONEMASONS.—The strike of Newcastle and district stonemasons was under the consideration of the local Building Trade Employers' Association, Northumberland-street, on the 20th inst. The deliberations lasted for about two hours. At the close the reporters were informed that the masters had decided to withdraw the notices relative to a nine hours' day instead of an eight hours' one, and other suggested alterations of rules — a decision which means that the men affected will restart work. The employers, it is stated, fully expected that the men would have granted the asked-for extension of a week's time, and if such had been given, they state that there would have been no strike. The Newcastle masters could not settle the dispute until there had been a meeting of the Northern Counties Federation, when they could secure advice on the subject.

NEWCASTLE BRICKLAYERS' WAGES. — On the 16th inst a meeting of the union bricklayers of Newcastle and district was held in the Co-operative Hall, Darn Crook, Newcastle, for the purpose of considering the employers' request for a reduction in the men's wages of 1d. per hour, making the rate 9d. The men declined to consider the question of any reduction. The notice of reduction does not expire until September 12.

LEGAL.

ACTION BY ARCHITECTS.

THE case of Ardron & Dawson *v.* Edwards came before Mr. Justice Grantham and a special jury in the King's Bench Division on the 21st inst., an action by the plaintiffs, a firm of architects carrying on business at No. 6, Old Queen-street, Westminster, against the defendant, Mr. William Maitland Edwards, for damages for alleged breach of contract.

The plaintiffs' case was that, in October, 1899, the defendant, a financier, entered into an agreement for a lease of certain premises in Great Tothill-street and the Broadway, Westminster, conditional upon his erecting certain buildings thereon in the manner therein described, and instructed the plaintiffs to prepare reports, plans, and specifications for that purpose. The plaintiffs alleged that, by letters passing between them and the defendant, dated October 11 and 12 and November 2, 1899, defendant agreed to pay them for this work, in the event of his being able to form a syndicate, as intended, for the erection of such buildings, the usual commission of 5 per cent. on the outlay thereby incurred, exclusive of out of pocket expenses. The estimated outlay for the work was 137,023*l.* The plaintiffs alleged that they prepared the necessary plans and specifications for the defendant, and that the syndicate which he had formed were erecting the buildings substantially in accordance with the plans, and that defendant refused to pay them any part of the 5 per cent. or any sum for the preparation thereof. Alternatively plaintiffs claimed

that between June, 1899, and March, 1900, at defendant's request, they prepared reports, plans, and specifications for him, and had various interviews and negotiations on his behalf in regard to the erection of buildings in or near Great Tothill-street and the Broadway, Westminster, for which they had not received any payment. The plaintiffs claimed to be paid a reasonable sum for such services at the rate of 3 per cent. on the estimated outlay of 137,023*l.*

The plaintiffs also claimed that between June, 1899, and February, 1900, they received instructions from defendant to do work on his behalf in connexion with (1) certain questions of ancient lights for St. Margaret's School, Westminster; (2) a proposed tenancy by Messrs. Cook & Hammond of premises in the buildings; and (3) the preparation of plans for stabling in Chapter-street and Regency-street, Westminster; and for the work under these heads the plaintiffs claimed 42*l.* There was also a claim by plaintiffs for 12*l.* 17s. 9d. for out-of-pocket expenses.

By his defence the defendant alleged that plaintiffs prepared the plans and specifications as a speculation, and in expectation that a syndicate which he was then endeavouring to form to erect the buildings would adopt the plans and employ the plaintiffs as architects. He alleged that, being unable to form that syndicate, the matter fell through. In April, 1902, a different syndicate to that contemplated in October, 1899, was formed, but defendant denied that that syndicate was erecting the buildings substantially, or at all in accordance with any plans of the plaintiffs. Defendant admitted that he employed the plaintiffs to do certain work in respect of property near Great Tothill-street, between the dates alleged, and brought into court the sum of 8*l.* 14s. as being sufficient to satisfy the plaintiff's claim.

Mr. Arthur Powell, K.C., and Mr. Herbert Smith, appeared for the plaintiffs; and Mr. Hume Williams, K.C., and Mr. W. S. Shaw, for the defendant.

During the course of Mr. Ardron's evidence a settlement was arrived at, the terms being that the defendant should pay to the plaintiffs in settlement of their claim, 500*l.*, and the costs of the action.

Judgment was entered accordingly.

WORKMEN'S COMPENSATION ACT CASES:

WEAVINGS *v.* KIRK AND RANDALL.

THE case of Weavings *v.* Kirk and Randall came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Matthew on the 22nd inst., on the appeal of the applicant from the refusal of Judge Addison, sitting at the Woolwich County Court, to award her compensation under the Workmen's Compensation Act, 1897. There was also a cross appeal by the respondents from the finding of the learned Judge that the place where the accident occurred was a "warehouse" within the meaning of the Act. Mr. Ruegg, K.C., and Mr. W. M. Thompson, appeared for the applicant, and Mr. Arthur Powell, K.C., and Mr. A. Willis for the respondents.

Mr. Ruegg, in opening the applicant's case, said he was appearing on behalf of the widow of a man who was killed while in the employment of the defendants, a large firm of builders and contractors. His case was that the learned County Court Judge was wrong in refusing to award the widow compensation under the Act. Originally the action was brought under the Employers' Liability Act. After hearing the evidence, Judge Addison thought the case under the Employers' Liability Act failed, and then application was made to the learned County-court judge to assess compensation under the Workmen's Compensation Act, 1897. The ground on which that was asked was that the place where the accident occurred was a "warehouse" and that the defendants were at all events, for the time being, the "occupiers" of the warehouse, and therefore the occupiers of a factory within the meaning of the Act. The learned County-court judge found that the place was a "warehouse" within the meaning of the Act, but he was of opinion that the defendants were not the "occupiers" of the warehouse in the meaning of the Act, and on that ground he refused to give compensation to the applicant. He submitted that the learned judge was clearly wrong on that point. The respondents, the employers, gave cross notice of appeal on the ground that the learned County-court judge was wrong in finding that the place was a warehouse at all. He (Mr. Ruegg) submitted, on the other hand, that the learned judge was justified in finding that the place where the accident happened was a "warehouse" within the meaning of the Act. The facts of the case were shortly these: The respondents, Messrs. Kirk & Randall, had entered into a contract with the Government to put up shelves in a place which formed part of the Woolwich dockyard, on which a large number of goods were to be stored for Army purposes. During the course of the work the applicant's husband, who was in the service of the respondents, fell and was killed. The learned counsel submitted that these facts showed that the respondents had undertaken to do work in a warehouse, and that they were for the time being the occupiers of the warehouse.

The Master of the Rolls said that the only point seemed to be whether the occupation was enough in the meaning of the Act to make the respondents "undertakers."

Mr. Ruegg said that the evidence was that the employers went there and took their workmen there, and were engaged in doing work at the time the man met with his death. That made the respondents the "undertakers" within the meaning of the Act. "Undertaker" within the meaning of the section meant the occupier, and Section 104 of the Factory Act, 1901, defined that the person having the actual use and occupation of a "dock, wharf, quay, or warehouse" shall be deemed to be the occupier of a factory.

The Master of the Rolls asked if that section was incorporated in the Workmen's Compensation Act.

Mr. Ruegg said it was.

The Master of the Rolls said he thought the Court had better hear what Mr. Powell had to say on the matter.

Mr. Powell said that the place where the accident happened was a Government store in the Woolwich Dockyard, and was part of a large building, and he submitted that, according to the distinctions drawn in this Court, it was not a "warehouse" within the meaning of the Act. His second point was that, even if it was a warehouse, the respondents were not the "occupiers" within the meaning of the Act. In the case of Burr *v.* Whiteley, that Court had laid down that there was a distinction to be drawn between a place where goods were simply stored and a warehouse. The fact that goods were simply stored in a room did not constitute the room where the goods were stored a warehouse. In the present case the goods which were stored were for Government purposes, and he submitted that that did not constitute the place a warehouse within the meaning of the Act. On his second point, that the respondents were not the "occupiers" of the warehouse within the meaning of the Act the learned counsel argued that if a man was sent into that court simply to glaze a window, the man was not the "occupier" within the meaning of the Act. Therefore, a man who was sent to put shelves into a warehouse could not be deemed to be the occupier. If he (counsel) asked the usher in the court to reach him a book from the shelves that did not constitute the usher the occupier of the court. To constitute the respondents the "occupiers" within the meaning of the Act, there must be occupation *qua* warehouse. It was not *qua* warehouse at all that the respondents were in there. They were simply putting up shelves in the place.

In the result their lordships sent the case back to the learned County Court Judge for him to state, if he could, what the evidence as to "occupation" was, and if it was not sufficiently in his mind to take evidence in order that he might inform the Court upon that point.

IVES *v.* LANGLEY.

ON the 22nd inst. the case of Ives *v.* Langley came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the appeal of the applicant from the refusal of the Judge of the King's Lynn County Court to award him compensation under the Workmen's Compensation Act, 1897, in respect of personal injuries sustained in the course of his employment with the respondent.

Mr. Disturnal appeared for the applicant, and Mr. Low, K.C., and Mr. North for the respondent.

Mr. Disturnal said that the point on which the learned County Court Judge decided against the applicant was that he was not, in the circumstances of the case, "on, in, or about a building" within the meaning of Section 7 of the Act when he met with the accident.

Mr. North said the learned Judge also found that the building was not being repaired or constructed by means of scaffolding.

Mr. Disturnal submitted that the learned Judge decided the case solely on the question of whether the applicant at the time of the accident was "on, in, or about a building," and upon that his contention was that the learned Judge misdirected himself, and that really in point of fact the evidence all went to show that the man was "on, in, or about a building" when he met with the accident. The defendant was a builder at King's Lynn, and he was building for himself, as building owner, four cottage houses under one roof. At the back of each house there was a yard, and from each yard there was a gate leading into a passage. The applicant was engaged in putting up the gate leading from the yard of the first house when he injured his knee. The injury developed, and the man became incapacitated, and was unable to follow his employment as a carpenter. In these circumstances the learned counsel submitted that the County Court Judge was wrong in holding that the workman at the time of the accident was not "on, in, or about a building."

The Master of the Rolls said he could not help feeling that the learned Judge decided the case on the question of scaffolding.

Mr. Low said that his instructions were that the learned Judge found that the man was not employed "on, in, or about a building" which was being constructed by means of scaffolding.

Mr. Disturnal said that if the Court took that view, he should argue that scaffolding was being used. It was true that there was no scaffolding at the moment in use on the house in the yard of which the accident occurred, but scaffolding was being used on the third house. The statute did not say "on, in, or about the house," but "on, in, or about a building," and that being so, his submission was that this workman was employed "on, in, or about a building" which was being constructed by means of scaffolding, the scaffolding being in the third house which was part of the one building.

Mr. Low submitted that the decision of the County Court Judge ought to stand. The Judge treated each cottage as a separate building, and therefore the question became one of fact whether or not the workman was employed "on, in, or about a building" on which scaffolding was being used. He contended that the plaintiff was not at work "on, in, or about a building"; but if he was, he was not at work on a building on which scaffolding was being used.

The Master of the Rolls, in giving judgment, said that, in his opinion, the appeal must succeed. In this case there was no material on which the Court could say whether the learned Judge decided that no scaffolding was being used. All he, in fact, said by his judgment was that the workman was not employed "on, in, or about a building." That was a conclusion which could not be supported by the evidence, which showed that the man was employed "about" the erection of the cottages. The gate was in the curtilage of the building and was part of the undertaking. Then the Court knew that scaffolding was being used in one of the cottages, which was part of the entire building. For these reasons, the decision of the County Court Judge could not stand.

The Lords Justices concurred, and the appeal was accordingly allowed with costs.

On the application of Mr. Disturnal an order was made for the payment to the workman of 18s. 11d. a week (being half his average weekly earnings) as from July 3 last during incapacity.

ELVIN *v.* WOODWARD AND CO.

THE case of Elvin *v.* Woodward & Co. came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 21st inst., on the appeal of the applicant, a painter in the employment of the respondents, from an award of the Judge of the Shoreditch County Court, under the Workmen's Compensation Act, 1897.

It appeared that the respondents had contracted to repair and paint a house in Finsbury-square, E.C., which was above 30 ft. in height, and the applicant was engaged in the painting work of the house. On the day the accident happened the applicant was painting a wall 10 ft. or 11 ft. high above the street, and was standing upon a pair of painters' steps, which were 8 ft. high, and had ten flat steps, with a board on the top, upon which any one could stand when at work. The steps were supported by wooden uprights, and could easily be moved from place to place. While standing on the steps the applicant slipped, fell off, and sustained injury. At this time, the main scaffolding which had been used in repairing the house had been taken down. The learned County Court Judge found that the applicant was injured by a fall from steps upon which he was standing to enable him to paint a wall higher than he could reach when standing on the ground; but he held that the steps, though used at the time of the accident to support the man while doing the work, afforded no evidence that the house in question was being repaired by means of scaffolding, and gave his award in favour of the respondents. If the Court of Appeal should be of opinion that there was any evidence on which he might find that the steps were a scaffolding he awarded the applicant 1*l.* a week for fourteen days after the accident. He accordingly gave judgment for the respondents. Hence the present appeal of the applicant.

At the conclusion of the arguments of counsel the Master of the Rolls, in giving judgment, said it was exceedingly difficult to find any principle of law to apply in ascertaining what was a scaffolding. He however based his decision on this, that these steps might be a scaffolding. He could not draw any distinction in point of law between a staging consisting of planks placed across trestles or footstools (*vide* decision of House of Lords in "Hoddinott *v.* Newton, Chambers & Co.) and ordinary painter's steps which carried their own support with a top wide enough to form a platform for a man to stand upon when at work. That being so he thought there was evidence on which the learned County Court Judge might find that the steps were a scaffolding, and he therefore was of opinion that the appeal should be allowed and an award made in favour of the applicant for 1*l.* a week from fourteen days after the accident.

Lord Justice Stirling differed from the judgment of the Master of the Rolls. He did not think that an ordinary pair of painter's steps, which enabled a painter to paint a wall out of his reach from the ground could fairly be regarded as a scaffolding. He thought the view taken by the learned County Court Judge was correct.

Lord Justice Mathew agreed with the judgmen of the Master of the Rolls, and by a majority of the Court the appeal was accordingly allowed.

A stay of execution was granted upon the terms

of the respondents agreeing to pay the applicant 1*l.* a week from fourteen days after the accident, the costs being paid to the applicant's solicitor upon their undertaking to repay them if an appeal to the House of Lords should prove successful.

Mr. Ruegg, K.C., and Mr. Chester-Jones appeared for the applicant; and Mr. Arthur Powell, K,C., and Mr. Addington Willis for the respondents.

SUNDERLAND BUILDING BY-LAWS:

BUILDER'S APPEAL.

THE hearing of the case of White *v.* The Mayor, &c., of Sunderland, was concluded before a Divisional Court of the King's Bench, composed of the Lord Chief Justice and Justices Wills and Channell, on the 21st inst., on the appeal of Mr. John William White, a builder, of Sunderland, from a decision of the Sunderland magistrates, convicting him of a breach of the borough by-laws in connexion with the building of houses called Colchester-terrace, on the High Barnes estate. The charge against the appellant was with having, between July 7 and September 2, 1902, unlawfully erected a building at Colchester-terrace on a site with party walls of less thickness than 9 in., as required by the by-laws made under the provisions of the Public Health Act, 1875. It appeared that certain plans were approved in 1885, and several of the houses were erected before the passing of the new by-laws, but the Local Authority required the appellant to comply with the new by-laws in respect to the houses which had not been commenced, and as he refused he was summoned before the magistrates and fined. He now appealed on the ground that the buildings which remained to be erected at Colchester-terrace were not "new buildings," that they had been commenced before the passing of the new by-laws and were therefore excepted from the operation of those by-laws.

Mr. Montague Lush, K.C., and Mr. Schiller appeared for the appellant, and Mr. C. A. Russell, K.C, and Mr. Sismey represented the respondents.

Mr. Lush agreed that the appellant had acquired an indefeasible right to erect the houses according to the plans which had been approved, and that the local authority could not deprive him of that right by passing new by-laws, and that the new by-laws were *ultra vires* in so far as they sought to deprive the appellant of the right which he had acquired. He further argued that Colchester-terrace was one entity—one building in fact, and that the commencement of one of the houses which formed the terrace was the commencement of the whole terrace.

Mr. C. A. Russell having addressed the Court on behalf of the respondent to the appeal,

The Lord Chief Justice, in giving judgment, said he had come to the conclusion that the Justices were right in coming to the decision which they had done on the evidence before them. He did not see any hardship or unfairness in the alteration of the new by-law as to the thickness of party-walls, and he thought it would be very undesirable to tie the hands of local authorities for all time from altering their by-laws in respect to the construction of houses simply because the houses formed part of a terrace, the plans in respect to which had been previously approved. The question in this case as to the time of the commencement of the building of the houses was one of fact, and he was of opinion that the new by-laws were not *ultra vires*, and that the Justices were right.

The other learned Judges concurred, and the appeal was accordingly dismissed with costs.

PATENTS OF THE WEEK:

APPLICATIONS PUBLISHED.*

4,577 of 1902.—J. J. JOURNEYMAN: *Apparatus for Lifting Stone or other Material.*

An apparatus for lifting stone and other material, comprising rising and falling arms suspended from the hook of the lifting tackle, pivoted levers passing therethrough; a cross-bar to which the levers are pivoted carrying a screw for adjustment in relation to the stone to be lifted; levers pivoted to the side levers previously referred to provided with shoes, or plates, at one end to engage with the material to be lifted, and at the other end with one or more toothed wheels, or sectors, and pivoted catch levers operating in connexion with the toothed wheels.

8,257 of 1902.—W. C. LINDSAY: *Drawing Stands and Tables.*

Means for fixing a board in an upright position consisting of separate detachable legs, each prepared at the top to fit to the board, and to receive a locking bolt which passes through the board, or part thereof.

2,679 of 1903.—W. GRAINGER: *Fire Grates or Furnaces Applicable for Heating Washing Boilers and for other Purposes.*

Grates or furnaces, having the receptacle for the fire of a short grate bottom with sloping back at rear, and in front fire bars with outwardly projecting flange at top, in combination with a pair of wing plates projecting forwards from the sides of the grate, a sloping shutter arranged to slide in guides over the space between the lower part of said wing plates, so that it can be raised or lowered to increase or diminish, or entirely cut off the supply of air admitted to the fire or flue through the vertical bars, and a plate located over the space between the wing plates at the upper part so as to close the same or admit when removed to a free opening for feeding fuel into the fire.

23,812 of 1902.—R. WRIGHT and R. P. B. WRIGHT: *Construction of Windows.*

Windows having sliding sashes, consisting in mounting the sashes on rods located at one side of the sash frame, so as to render the said sashes capable of being swung inwards.

26,777 of 1902.—L. LLEWELLIN: *Locks.*

For preventing the opening of locks and the like from outside the apartment, a plate to cover the lock or the like and having three flanges, by the upper of which flanges the plate is hinged to the door, the lower flange having a continuation extending floorward, the said continuation being provided with a slot near its lower end, through which slot protrudes a staple attached to the door, the whole being held down by a padlock attached to the said staple.

1,553 of 1903.—E. J. HOPKINS and J. G. KEILLER: *Windows and the Like.*

Windows and the like, consisting of spring bolts fitted on the sashes, slotted plates mounted on the window frames and in the slots of which the said spring bolts are adapted to engage automatically to hold the sashes securely in position, and devices for causing the withdrawal of the said spring bolts to allow of the sashes being moved to new positions.

2,164 of 1903.—S. G. WELLMAN: *Sash Locks or Fastenings.*

A sash lock comprising a casing having a transverse pivot aperture at one end and a stop shoulder at the opposite end, and a dog located therein provided with a lip deflected into a plane parallel with the body of the dog to enter said aperture, and lateral flanges at the opposite end to engage said shoulder.

2,501 of 1903.—J. T. YOUNG and J. WREN: *Spring Catch for Sliding Sashes of Windows, Louvres, and the Like.*

An automatic spring catch for sliding sashes of windows, louvres, and the like, consisting in a spring bolt mounted within a casing on the frame, and having a bevelled head in combination with a metallic wearing or catch-plate on the stile of the sash, said plate having a series of bevelled recesses.

18,583 of 1902.—G. LIVINGSTONE and THE SANITARY BLOCK AND TILE PAVEMENT CO., LTD.: *Manufacture of Blocks and Tiles for Paving and other Purposes.*

This consists in the manufacture of a block or tile by mixing granulated wood with a binding agent.

1,925 of 1903.—J. TAYLOR and L. ASHWORTH: *Ridge Tiles.*

A ridge tile formed at one end with an internal recess end cut or plain and at the other end with corresponding external projections so as to form a tongue and groove or dovetail interlocking engagement when in position on a roof ridge.

1,998 of 1903.—T. H. MOONEY: *Mosaic Tiling.*

The process for making mosaic tiling, which consists in placing a body of cement and particles of marble in a semi-liquid form in a mould, in imparting to said mould a series of quick vibrations during which the particles of marble and the cement become united and the surplus water rises to the surface, in applying to the back of said cement and particles of marble a body of cement and sand in semi-liquid form, in imparting to the mould a subsequent series of slow vibrations during which the body of cement and sand become set and adheres to the back of the particles of marble and sand, and the surplus water is caused to rise to the surface of the cement and sand.

26,258 of 1901.—L. P. FORD: *Manufacture of Artificial Stone Bricks.*

The continuous process of manufacturing artificial stone bricks and the like, which consists in automatically measuring the lime and sand, conveying the same to a pug or mixer, thoroughly stirring and heating the materials, slaking the lime, and, if necessary, wetting the materials in said mixer, and conveying them towards one end of the same, and cooling them on their exit, prior to their entrance into the brick-making machine.

26,259 of 1901.—L. P. FORD: *Mould for the Manufacture of Large Blocks of Artificial Stone.*

The manufacture of artificial stone when use is made of the expanding property of lime or cement to obtain compression, consisting of a cylindrical mould.

7,216 of 1902.—G. C. HURRELL: *Pipes or Conduits for Electrical Conductors.*

This consists of casings of a simple parallel form, provided with separate jointing and bearing blocks.

7,694 of 1902.—J. R. HORTON: *Kilns or Apparatus for Calcining Purposes.*

A kiln or apparatus for calcining purposes, the bottom of which is made with downwardly inclined surfaces that terminate in inclined outlets, each provided both with an inner door, whereby the outlet can be completely closed, and with an inner door that can be independently operated and is adapted to arrest the discharge of treated material through the outlet when required and to hold up the contents of the kiln or furnace in such a way as to enable the outer door to be easily and quickly closed.

9,117 of 1902.—J. BRIGGS and W. HANSON: *Draught Plates for Kitchen Ranges, Steam Boiler Furnaces, or the Like.*

This consists in the combination of a draught-plate for kitchen ranges and steam boiler furnaces, of a fan or fans cut from the sheet with radial vanes, and the construction of draught-plates for kitchen ranges and steam boiler furnaces, or the like, consisting of a fan or fans cut from a sheet of metal with radial vanes, each fan arranged to revolve within a ring of metal surrounding the edges of the fan or fans, which are carried by cross strips of metal.

9,648 of 1902.—G. R. SMITH: *Apparatus for Heating Greenhouses, Buildings, and the Like by Liquid Fuel.*

In an apparatus for heating greenhouses, buildings, and the like by liquid fuel the combination of a vertical boiler, water inlet and outlet circulating pipes connected therewith, a central flue in said boiler open at top and bottom and provided with cross or other water circulating tubes, a burner for consuming liquid fuel in the form of spray situated at the bottom of the boiler flue to heat the same, a vessel containing the liquid fuel under air pressure, and pipes for conveying the same to the burner, with means for regulating the flow, the whole forming a heating apparatus.

10,705 of 1902.—R. PAGE: *Appliance for Fastening Windows and Retaining Window Sashes in any Position.*

Construction of an appliance for fastening windows and retaining window sashes in any position, consisting of a plate having turned-up ends for clamping the sashes, a clamping plate laid upon the side of one of the sashes and a screw passing through one of the turned-up ends of the first plate by which the respective sashes may be pressed together.

11,378 of 1902.—C. J. HARCOURT: *Hinges.*

This consists of butt hinges with joint tubes or sockets locked to the body part of the respective plates or butts.

11,905 of 1902.—G CASTLEDEN and J. STUDD: *Door and Gate Latches.*

In a door and gate latch, the employment of a pivoted latch or bolt, the nose of which normally engages laterally with a catch, and the tail of which is adapted to be operated by a rotary handle or pivoted lever.

12,383 of 1902.—H. D. TILLY: *Portable Domestic Fire Escape.*

This consists of an improved portable fire-escape, comprising a ladder constructed of twisted steel wires forming the sides, and cross wires twisted to the side wires, and threaded through steel or iron tubes forming the rungs.

8,132 of 1902.—W. H. EDWARDS: *Fastenings and Bolts for Casements, Doors, Windows, and the Like.*

A fastener for casements, doors, windows, and the like, consisting of an operating handle having a sleeve or extension, which constitutes the bolt of the fastener, such bolt being mounted upon a stationary peg or bracket arm, and the advancing and retiring movement being obtained (when the handle is brought over or rotated) either by the action of a screw thread on one part and an engaging stud or projection on the other part, or by engaging screw threads formed on both the parts.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

MEETINGS.

FRIDAY, APRIL 24.

Institution of Civil Engineers (Students' Meeting).—Mr. H. S. Watson on "Bacterial Sewage-Disposal Works at Ash, Dover." 8 p.m.

Royal Institution.—Hon. R. J. Strutt, M.A., on "Some Recent Investigations on Electrical Conduction." 9 p.m.

Institution of Mechanical Engineers.—1. President's Address. 2. Professor W. E. Dalby on "The Education of Engineers in America, Germany, and Switzerland." 8 p.m.

SATURDAY, APRIL 25.

Royal Institution.—Professor Langton Douglas, M.A., on "The Early Art of Siena." I. 3 p.m.

MONDAY, APRIL 27.

Society of Arts (Cantor Lectures).—Mr. W. Worby Beaumont on "Mechanical Road Carriages." I. 8 p.m.

Builders' Benevolent Institution (31, Bedford-street, W.C.).—Committee meeting at 5 p.m.

TUESDAY, APRIL 28.

Society of Arts (Applied Art Section).—Visit to the Whitefriars Glassworks. Paper by Mr. H. Powell on "Modern Table Glass." 7.30 p.m.

Institution of Civil Engineers.—Annual general meeting of corporate members only, to receive the Report of the Council, and to elect the Council and auditors for the ensuing year. 8 p.m.

WEDNESDAY, APRIL 29.

Architectural Association Discussion Section.—Mr. H. Cotman on "A Tour in Gloucestershire." 7.30 p.m.
Society of Arts.—Mr. T. A. Brockelbank on "Automatic Waggon Couplings on British Railways." 8 p.m.
Edinburgh Architectural Association.—Mr. A. Hunter Crawford on "The Building of a House." V. Illustrated. 8 p.m.
Institution of Civil Engineers.—Students' visit to inspect the widening operations in progress at London Bridge. Assemble at the Bridge, north side, 2.30 p.m.
Southern Counties Builders' Federation (31, Bedford-street, W.C.).—Council meeting at 3 p.m. Annual general meeting at 3.30 p.m.

THURSDAY, APRIL 30.

Royal Institution.—Professor Dewar. M.A., on "Hydrogen: Gaseous, Liquid, and Solid." II. 5 p.m.
Institution of Electrical Engineers.—Mr. W. Aitken on "Divided Multiple Switchboards: An Efficient Telephone System for the World's Capitals." 8 p.m.

FRIDAY, MAY 1.

Architectural Association.—Mr. A. Needham Wilson on "Architecture and the Public." 7.30 p.m.
Junior Institution of Engineers.—Mr. R. W. Newman on "The Effect of Design on Methods of Construction, from a Contractor's Point of View." 8 p.m.

SATURDAY, MAY 2.

Royal Institution.—Professor Langton Douglas, M.A., on "The Early Art of Siena." II. 3 p.m.
British Institute of Certified Carpenters (*Carpenters' Hall*).—Business meeting, 6 p.m.
Edinburgh Architectural Association.—Visit to Wemyss Castle.
Sanitary Inspectors' Association.—Visit to works of Stuart's Granolithic Stone Co., Ltd., Millwall, E.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 7.—By J. C. TOWNER (at Lewes).

Chailey, Sussex.—Middleton Farm, 21 a. 3 r. 36 p., f., y.r. 27*l.* 10s. £1,325
Westlands Farm, 16 a. 1 r. 10 p., f. and c., y.r. 35*l.* 1,000
Plumpton, Sussex.—Sevelands Farm, 19 a. 2 r. 35 p., part f. and part u.t. 1,693 yrs., g.r. 6s. 8d., y.r. 37*l.* 940

April 15.—By LEOPOLD FARMER & SONS.

Kilburn.—36, Oxford-rd., u.t. 55 yrs., g.r. 11*l.*, e.r. 55*l.* 460
Highbury.—108, Highbury New Pk., u.t. 46½ yrs., g.r. 12*l.* 10s., e.r. 95*l.* 1,000

By WM. THOMSON (at Douglas).

Douglas, Isle of Man.—Victoria-st., &c., the Grand Hotel, the Colonnade Hotel and Restaurant, the Victoria Swimming Baths, and premises adjoining; also two shops and two boarding-houses, area 3,313 yds., f., e.r. 1,723*l.* (in one lot) 27,500

By A. BURTENSHAW & SON (at Hailsham).

Hellingly, Sussex.—1 to 4, Egerton Cottages, f., w.r. 52*l.* 700
Hailsham, Sussex.—53, South-rd., f., y.r. 22*l.* .... 55 to 61 (odd), South-rd., and cottage adjoining, f., w.r. 38*l.* 6s. 650

April 16.—By FURBER, PRICE, & FURBER.

Paddington.—137, Fernhead-rd., u.t. 81 yrs., g.r. 8*l.*, e.r. 70*l.* 530

By C. GERRETT & CO.

Norwood.—Woodside Green, Studley, f., p. 1,200
9 and 11, Werndee-rd., f., y.r. 60*l.* 750

By KROENIG & CO.

Hendon.—Sunny-gdns., Emile Villa, f., e.r. 45*l.* 660
67, Church-rd., u.t. 62½ yrs., g.r. 5*l.*, e.r. 36*l.* .. 450

April 17.—By DUNN, SOMAN, & COVERDALE.

Barking, Essex.—Choats Manor Way, freehold grazing marshes, 53 a. 2 r. 21 p. 2,350
Choats Manor Way, enclosure of marsh land, 5 a. 2 r., f. 1,850

By P. & G. GEEN.

Islington.—7 to 15 (odd), St. Paul-st., u.t. 24 yrs., g.r. 21*l.*, y.r. 167*l.* 1,120

By LESLIE, MARSH, & CO.

Kensington.—32, Holland Villas-rd., u.t. 48¼ yrs., g.r. 25*l.*, y.r. 145*l.* 2,100

By FRED. VARLEY & SON.

Finsbury Park.—31, 33, and 35, Ambler-rd., u.t. 64½ yrs., g.r. 18*l.* 18s., y.r. 120*l.* 1,275
19, Ennis-rd., u.t. 64 yrs., g.r. 6*l.* 6s., y.r. 45*l.* .. 385
17, Gloucester-rd., u.t. 56 yrs., g.r. 12*l.* 12s., e.r. 70*l.* 750

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 15 0	per 1,000 alongside, in river.
Rough Stocks and Grizzles	1 12 0	,, ,, ,,
Facing Stocks	2 12 0	,, ,, ,,
Shippers	2 5 0	,, ,, ,,
Flettons	1 7 6	,, ,, ,,
Red Wire Cuts ..	1 12 0	,, at railway depôt
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Ruabon Facing	5 0 0	,, ,, ,,
Best Blue Pressed Staffordshire ..	4 5 0	,, ,, ,,

PRICES CURRENT (*Continued*).

BRICKS, &c.

	£ s. d.	
Do. Bullnose	4 11 0	per 1,000 at railway depôt.
Best Stourbridge Fire Bricks	4 8 0	,, ,, ,,
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers.....	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats.....	17 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers..	16 0 0	,, ,, ,,
One Side and two Ends.....	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	20 0 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats.....	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers..	14 0 0	,, ,, ,,
One Side and two Ends.....	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays Chamfered, Squints.....	14 0 0	,, ,, ,,
Second Quality White and Dipped Salt Glazed	2 0 0	,, less than best.
Thames and Pit Sand	6	9 per yard, delivered.
Thames Ballast	6	0 ,, ,,
Best Portland Cement	30	0 per ton, delivered.
Best Ground Blue Lias Lime..	21	0 ,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 10s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Bath ,, ...	1 7	,, ,,
Farleigh Down Bath ..	1 8	,, ,,
Beer in blocks	1 6	,, ,,
Grinshill ,, ...	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 0	,, ,,
Red Mansfield ,,	2 4	,, ,,
YORK STONE—*Robin Hood Quality.*		
Scappled random blocks	2 10	per ft. cube, deld. rly. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super. ,,
6 in. Rubbed two sides Ditto, Ditto	2 6	,, ,,
3 in. Sawn two sides slabs (random sizes)..	0 11½	,, ,,
2 in. to 2½ in. Sawn one side slabs (random sizes)	0 7½	,, ,,
1½ in. to 2 in. ditto, ditto	0 6	,,
BEST HARL YORK—		
Scappled random blocks	3 0	per ft. cube ,,
6 in. sawn two sides, landings to sizes (under 40 ft. sup.)	2 8	per ft. super. ,,
6 in. Rubbed two sides Ditto	—	,, ,,
3 in. sawn two sides slabs (random sizes)	1 2	,, ,,
2 in. self-faced random flags.....	0 5	,, ,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	13 2 6	per 1000 of 1200 at ry.dep.
20×12 ,, ,, ,, ..	13 17 6	,, ,,
20×10 best seconds ,,	12 15 0	,, ,,
20×12 ,, ,, ,,	13 10 0	,, ,,
16×8 best ,,	7 0 0	,, ,,
20×10 best blue Portmadoc	12 5 0	,, ,,
16×8 best blue Portmadoc	6 5 0	,, ,,
20×10 best Eureka unfading green....	15 2 6	,, ,,
20×12 ,, ,,	17 2 6	,, ,,
18×10 ,, ,,	12 10 0	,, ,,
16×8 ,, ,,	10 5 0	,, ,,
20×10 permanent green	11 0 0	,, ,,
18×10 ,, ,,	9 5 0	,, ,,
16×8 ,, ,,	6 10 0	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles..	42 0	per 1,000, at rly. depôt.
Hip and valley tiles.....	3 7	per doz. ,, ,,
Best Broseley tiles	50 0	per 1,000 ,, ,,
Do. Ornamental Tiles	52 6	,, ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles.....	3 0	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	51 9	per 1,000 ,, ,,
Do. Ornamental Do.	54 6	,, ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,
Best "Rosemary" brand plain tiles	48 0	per 1,000 ,, ,,
Do. Ornamental Do.	50 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,

PRICES CURRENT (*Continued*).

WOOD.

	At per standard.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	£ s. d. 15 10 0	£ s. d. 16 10 0
Deals: best 3 by 9.....	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.....	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0	0 less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in. ..	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in. ..	8 10 0	9 10 0
Foreign Sawn Boards—		
1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.).....	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)..	3 5 0	3 15 0

JOINERS WOOD.	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.....	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
,, ,, 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.....	18 0 0	19 10 0
Battens.....	13 10 0	15 0 0
Second yellow deals, 3 in. by 11 in.....	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens.....	11 10 0	12 10 0
Third yellow deals, 3 in. by 11 in.....	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
,, ,, 3 in. by 9 in.	13 10 0	14 10 0
Battens.....	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 10 0	14 10 0
,, ,, ,, 3 in. by 9 in.	12 10 0	13 10 0
,, ,, ,, battens.....	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes ..	33 0 0	upwards.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 6
Small ,, ,, ...	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8
¾ in. do. do.	0 0 6½	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 10 0	20 0 0
American Whitewood Planks—		
Per ft. cube	0 4 0	- - -

Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot.....	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched.....	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched.....	0 16 0	1 1 6
1 in. by 7 in. white, planed and shot.....	0 11 6	0 13 6
1 in. by 7 in. white, planed and matched.....	0 12 0	0 14 0
1¼ in. by 7 in. white, planed and matched.....	0 14 6	0 16 6
¾ in. by 7 inch yellow matched and beaded or V-jointed boards	0 11 0	0 13 6
1 in. by 7 in. do. do. do.	0 14 0	0 18 0
¾ in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6-in. at 6d. to 9d. per square less than 7-in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton.	
	£ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders ,, ,,	8 2 6	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 2 6	8 5 6

METALS.

	Per ton, in London	
IRON—	£ s. d.	£ s. d.
Common Bars.....	7 15 0	8 5 0
Staffordshire Crown Bars, good merchant quality	8 5 0	8 15 0
Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price.....	9 5 0	9 10 0
,, galvanised.....	16 0 0	- - -

,, (* And upwards, according to size and gauge.)

[*See also page 447.*

COMPETITIONS, CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*Carnegie Library and Museum	Limerick Borough Council	75*l.* and 25*l.*	June 18
*Artisans' Dwellings, High Wincobank Estate	Sheffield City Council	50*l.*, 30*l.*, and 20*l.*	No date.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
Additions, &c., to Shed, Bristol	Great Western Railway Co.	G. K. Mills, Paddington Station, W.	April 28
House, Pontypool, Mon.	do.	do.	do.
Public Baths, Chapman-street, &c.	Oldham Corporation	Groome & Grant, Architects, 2, St. Peter's-square, Manchester	do.
Additions to Gas Works	Ilford Gas Co.	The Engineer, Gas Works, High-road, Ilford	do.
Two Bridges, over River Spodden	Rochdale Corporation	Borough Surveyor, Town Hall, Rochdale	do.
Villa, Milnsbridge, Yorks.	.....	J. E. Lunn, Architect, Milnsbridge	do.
Chancel and Vestries, Christ Church, Moldgreen	.....	E. W. Lockwood, Architect, 37, Byram-arcade, Huddersfield	do.
Rebuilding Inn, Lower Cumberworth, Yorks	.....	J. B. Abbey & Son, Architects, 34A, New-street, Huddersfield	do.
Two Houses, Mapplewell, near Barnsley	.....	Crawshaw & Wilkinson, Architects, 13, Regent-street, Barnsley	April 29
Hospital at Workhouse	Claremorris (Ireland) Guardians	John Ritchie, Civil Engineer, Ballinrobe	do.
Additions to Council Offices	Colchester Corporation	H. Goodyear, Civil Engineer, Town Hall, Colchester	do.
Alterations to Premises, Union-street, Dewsbury	Messrs. J. Tetley & Son, Ltd.	F. W. Ridgway, Architect, Bond-street, Dewsbury	do.
Workhouse Mortuary	Pontypool Guardians	T. Watkins, Club Chambers, Pontypool	do.
Foundation Works, London-road, &c.	Manchester Corporation	City Treasurer, Town Hall, Manchester	do.
Ten Houses, Sunderland-road, Gateshead	North Eastern Railway Co.	Wm. Bell, Architect, Central Station, Newcastle	do.
Hospital Buildings, Bradpole	Bridport R.D.C.	J. J. Roper, 74, East-street, Bridport	do.
Additions to Workhouse Infirmary	Holbeach Guardians	Burdett Ward, Architect, Wisbech	do.
*Erection of Verandah, Cliftonville, Margate	Metropolitan Asylums Board	Office of Board, Embankment, E.C.	do.
Additions, &c., to Schools, Cleator Moor	.....	R. Robertson, Civil Engineer, Public Offices, Cleator Moor	April 30
Chapel, Carno, Wales	.....	R. Swancott, Cae-du Cottage, Carno	do.
Foundry, Offices, &c., Nile-street, Huddersfield	.....	B. Stocks, Architect, St. Peter's-street, Huddersfield	do.
Church Restoration, Wanlip, near Leicester	.....	C. H. Fowler, Architect, The College, Durham	do.
Cottage, Lochboisdale, South Uist, N.B.	.....	Donald MacGregor, Oban	do.
Rebuilding Chapel, Fochriw, Wales	.....	James & Morgan, Architects, Charles-street Chambers, Cardiff	do.
Cottages, Richmond-road, Abergavenny	Mr. R. Lewis	B. J. Francis, Architect, Abergavenny	do.
Hotel, Bowerham, Lancs	Mr. W. Mitchell	Harrison & Co., Architects, Church-street, Lancaster	do.
Corn Mill, Buckie, N.B.	.....	Alex. Gray, 3, Cluny-square, Buckie	do.
Gas Works	North Berwick Town Council	A. D. Wallace, Town Clerk, North Berwick	do.
*Oak Fencing, Tooting Home	Wandsworth and Clapham Union	The Clerk's Office, St. John's Hill, S.W.	do.
Boundry Wall, Lower Wortley	Leeds Corporation	City Engineer's Office, Leeds	May 1
*New Coast Guard Station, Sunderland	The Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
Water Supply Works, Thornton Dale	Pickering R.D.C.	J. E. Parker, Civil Engineer, Post Office Chmbs., Newcastle-on-Tyne	do.
Excavating Track & Laying Pipes (3 mls.) Booth Moor	Rishworth U.D.C.	R. Horsfall & Son, Engineers, 22A, Commercial-street, Halifax	do.
Extension of Gas Works	Abercarn (Mon.) Town Council	T. Canning, Civil Engineer, Mill-street, Newport, Mon.	do.
Additions, &c., to Workhouse	Chester Guardians	J. H. Davies & Sons, Architects, 14, Newgate-street, Chester	do.
Electricity Sub-station, Whickram-street	Sunderland Corporation	J. F. C. Snell, Civil Engineer, Town Hall, Sunderland	do.
Baths Foundations, Beverley-road	Hull Corporation	A. E. White, Civil Engineer, Town Hall, Hull	do.
*Cleaning, &c. Goods Warehouse, &c., at St. Pancras	Midland Railway	Engineer's Offices, Derby Station	do.
*Painting, &c., Sheffield Goods & Locomotive Stns., &c.	do.	Companys' Architect, Cavendish House, Derby	do.
Additions to Premises, Stanhope-street, Belfast	.....	Blackwood & Jury, Architects, 41, Donegall-place, Belfast	do.
Additions to Schools St. Mary, Bourne	.....	S. Clarke, Whitchurch, Hants	do.
Electric Lighting Station	Leek U.D.C.	J. Taylor, Architect, Leek	May 2
Water Supply Works	Settle R.D.C.	T. A. Foxcroft, Surveyor, Town Hall, Settle	May 4
Alterations to Haugh Shaw School	Halifax School Board	W. H. Ostler, 22, Union-street, Halifax	do.
Works at Chapel, Castle-street, Luton	.....	J. R. Brown & Son, Architects, Luton	do.
Additions to Public Hall, Rusholme	Manchester Corporation	City Architect, Town Hall, Manchester	do.
Bridge Works, near Preston	Lancs C.C. and Preston &c., R.D.C.	Clerk, County Council Offices, Preston	do.
Bridge Works, Blackford	Lancs C.C. and Bury Corporation	do.	do.
Shelters, Bandstand, &c., Grant-Thorold Park	Grimsby Corporation	H. G. Whyatt, Civil Engineer, Town Hall-square, Grimsby	do.
Laying Water Mains, &c.	Macclesfield R.D.C.	J. Thorpe, King Edward-street, Macclesfield	do.
Electricity Supply Station Superstructure	Southampton Corporation	J. A. Crowther, Engineer, Municipal Offices, Southampton	do.
*Formation of Roads and Sewers, Tottenham	Inc. Soc. of Licensed Victuallers	G. Treacher, Architect, 73, Moorgate-street, E.C.	do.
*Technical Institute and Free Library	Portsmouth Corporation	G. E. Smith, Architect, 145, Victoria-road North, Southsea	May
*Additions to Literary Institute, Aylesbury	The Committee	F. Taylor, Architect, Aylesbury	do.
*Sewerage Works	Bromley U.D.C.	Council's Surveyor, Bromley, Kent	do.
*Tar Paving Works	do.	do.	do.
*Supply of Road Materials	do.	do.	do.
*Alterations and Additions to Hospital, Winchmore Hill	Metropolitan Asylums Board	Office of Board, Embankment, E.C.	May 6
*Erecting Sanitary Annexes, Leavesden Asylum	do.	do.	do.
*Laying Steel Pipes	Hammersmith Borough Council	Council's Surveyor, Town Hall, Hammersmith, W.	do.
*Wood Paving Works	do.	do.	do.
*Disposal of Clinker from Refuse Destructor	Fulham Borough Council	Borough Electrical Engineer, Townmead-road, Fulham	do.
*Erection of Schools	Acton School Board	C. Monson & Sons, Architects, Grosvenor House, Acton Vale, W.	May 7
*Painting, &c. Repairs to Tate Public Library	Lambeth Borough Council	Borough Engineer, Lambeth Town Hall, S.E.	do.
Office at Waterworks, near Shawford	Southampton Corporation	W. Matthews, Engineer, Municipal Offices, Southampton	do.
Engine Room, Boiler House, &c.	Bridlington Corporation	E. R. Matthews, Civil Engineer, Town Hall, Bridlington	May 9
*Conveniences, &c. Highbury Fields	London County Council	Architects' Department, 18, Pall Mall East, S.W.	May 12
*Bothy, Potting Shed, &c., Meath Gardens	do.	do.	do.
*Erection of Male and Female Blocks, &c., at Asylum	Down District Asylum Committee	Graeme, Watt, & Tulloch, 77A, Victoria-street, Belfast	May 13
*Alterations to Barnet Workhouse	Barnet Union	White, Son, & Pill, High-street, Barnet	do.
*Orphanage Buildings, Walsall	R.A.O.B. Orphanage Fund	F. W. Mager, Hon. Architect, Aldridge, near Walsall	May 14
*Freshwater and Totland Main Sewerage Works	Isle of Wight R.D.C.	W. B. G. Bennett, Son, & Berry, Southampton	do.
*Two Lodges, Stables, and Loco Shed, &c.	Birmingham Corporation	J. Mansergh & Sons, 5, Victoria-street, S.W.	do.
*Supplying and Fixing Fire Hydrants, Main, and Pump	Metropolitan Asylums Board	Office of Board, Embankment, E.C.	May 19
*Land Registry, Lincoln's Inn Fields, W.C.	Commissioners of H.M. Works	H.M. Office of Works, Storey's Gate, S.W.	do.
*Cottage Dwellings, Wood Green	London County Council	Architects' Department, 19, Charing Cross-road, W.C.	May 26
*Pulling Down & Re-erecting New Building, Oxford-st.	.....	A. Newton & Co., Solicitors, 23, Great Marlborough-street, W.	No date.
Ten Houses, Grenville-street, Dukinfield	.....	George & Son, Architects, Old-square, Ashton-under-Lyne	do.
House, Heighington, Co. Durham	.....	J. Copeland, Post Office, Staindrop	do.
Hall, High-street, Neath	.....	Habershon & Co., Architects, 14, Pearl-street, Cardiff	do.
House, Alnwick	Mr. T. R. Reavell	G. Reavell, Junr., Architect, Alnwick	do.
Additions to Hotel, Askern, Yorks	Messrs. Carter's Brewery Co.	Garside & Pennington, Architects, Ropergate House, Pontefract	do.
Farm Buildings, &c. Ballidon, Derbyshire	Earl of Mansfield	W. Sugden & Son, Architects, Leek	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Officer to Teach Carpentry, &c., Poplar	London School Board	100*l.* &c.	April 28
*Borough Engineer and Surveyor	Stamford U.D.C.	300*l.*, &c.	May 1
*Assistant Engineer, Buildings Department	Rangoon Municipality	Rs.400 per mensem	May 4
*Assistant Surveyor (Eastern District)	Wandsworth Borough Council	200*l.*	May 9
*Assistant Works Engineer	Colombo Municipal Council	5,000 rupees per annum	June 1
*Assistant Mechanical Engineer	do.	4,000 rupees per annum	do.

PRICES CURRENT (*Continued*).

METALS.

	Per ton in London. £ s. d.	£ s. d.
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Sheet Iron, Galvanised, flat, best quality:—		
Ordinary sizes to 20 g.	16 0 0	- - -
,, ,, 22 g. and 24 g.	16 10 0	- - -
,, ,, 26 g.	18 0 0	- - -
Galvanised Corrugated Sheets:—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 0 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 5 0	9 15 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	15 7 6	- - -
Pipe in coils	15 17 6	- - -
Soil pipe	18 7 6	- - -
Compo Pipe	18 7 6	- - -
ZINC—Sheet—		
Vieille Montagne ton	28 5 0	- - -
Silesian	28 0 0	- - -
COPPER—		
Strong Sheet per lb.	0 0 10½	- - -
Thin ,,	0 0 11½	- - -
Copper nails ,,	0 0 11½	- - -
BRASS—		
Strong Sheet ,,	0 0 10	- - -
Thin ,, ,,	0 0 11	- - -
TIN—English Ingots ,,	0 1 5	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8½	- - -
Blowpipe ,,	0 0 9½	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	1¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths	2½d. ,, ,,
26 oz. thirds	4d. ,, ,,
,, fourths	3¼d. ,, ,,
32 oz. thirds	5d. ,, ,,
,, fourths	4¼d. ,, ,,
Fluted sheet, 15 oz.	3d. ,, ,,
,, 21 oz.	4d. ,, ,,
¼ Hartley's Rolled Plate	1¾d. ,, ,,
⅜ ,, ,, ,,	2d. ,, ,,
½ ,, ,, ,,	2½d. ,, ,,

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes or barrels.. per gallon	0 2 3
,, ,, ,, in drums	0 2 7
Boiled ,, ,, in pipes or barrels.. ,,	0 2 5
,, ,, ,, in drums ,,	0 2 9
Turpentine, in barrels ,,	0 3 8
,, in drums ,,	0 3 10
Genuine Ground English White Lead per ton	21 10 0
Red Lead, Dry ,,	20 0 0
Best Linseed Oil Putty per cwt.	0 8 0
Stockholm Tar per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for Seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TO CORRESPONDENTS.

E. S. & C.—J. F. W. & G. N.—(Amounts should have been stated.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

AMMANFORD.—For building police-station at Ammanford, for the Carmarthenshire County Council. Mr. David Jenkins, architect, Llandilo:—

Jones, Bros., Tirydail, Ammanford* £2,200

AMMANFORD.—For building three shops at Quay-street, Ammanford, for Mr. Jonathan Jones, Red Lion Hotel, Llangadock. Mr. David Jenkins, architect, Llandilo:—

James Davies, Penrhos Joinery Works, Llanelly* £1,400

BRANKSOME (Dorset).—For additions and alterations to Heatherlands girls' school, Branksome, for the Kinson (U.D.) School Board. Mr. Walter Andrew, architect and surveyor, Parkstone and Poole. Quantities by the architect:—

Miller & Sons	£2,240 0 0	Baker & Pearcy	£1,890 6 0
Burt & Vick..	2,065 0 0	C. Lawford† ..	1,717 0 0
A. & F. Wilson	2,034 17 3		
J. Hillman ..	1,925 13 0		

BRISTOL.—For the enlargement of Chester Park schools, Fishponds, for the School Board. Mr. W. V. Gough, architect, 24, Bridge-street, Bristol:—

J. Browning, Fishponds, Bristol.... £3,200 0 0
Plumbing.—A. & J. Tutcher, Bristol 302 10 0
Heating.—J. Crispin & Sons, Bristol 205 6 2

BRISTOL.—For the erection of Board school and domestic subjects' centre, Windmill Hill, Bedminster. Messrs. H. J. Jones & Son, architects, Bridge-street, Bristol. Quantities by Mr. Maynard Froud, Bristol:—

General Building Works.

J. E. B. James	£8,040	Wilkins & Sons	£6,398
W. Church	6,979	Walters & Son	6,350
Forse & Son	6,890	Stephens, Bastow, & Co., Ltd.	6,289
G. Humphreys	6,595	A. J. Beaven, Bristol*	6,280
E. Love	6,405		

Plumber's Work.

G. F. Tuckey, Bristol* £229

Heating.

Weech & Sons, Bristol* £360

CAMBRIDGE.—For the erection of house, showroom, &c., Newmarket-road, for Messrs. Ivett & Reed, monumental sculptors and masons. Mr. Paul Bausor, architect, 9, St. Andrew's-street, Cambridge. Quantities by the architect:—

A. J. Watson* £839
[Stonework, in addition, by the employers—estimated cost, £350.]

COLCHESTER.—For the erection of the Grand Theatre, Colchester, for Mr. H. Slocombe. Mr. J. W. Start, F.S.I., architect, Colchester. Quantities by the architect:—

E. Saunders	£24,475	Patman & Fotheringham	£20,700
Waring & Gillow	24,000	H. Lovatt	20,700
R. Beaumont	22,965	Kirk & Kirk, Westminster†	20,505
J. McKay	22,730	W. C. Theobald Chappel	19,640
E. West	22,449	Vickers & Son	19,090
Dupont & Co.	21,997	W. Chambers	18,989
Chessum & Sons..	21,400		
Grimwood & Sons	21,380		
S. Kenney	21,000		

[Extension of time required by last.]

CROYDON.—For the erection of a pair semi-detached cottages, Pampisford, S. Croydon. Mr. Money Marsland, architect, 68, Great Tower-street, E.C.:—

J. Pratt* £503

FOREST HILL.—For additions to works, for the "Oxychlorides, Ltd.," Kilmorie-road, Forest Hill, S.E. Mr. John Jas. Downes, architect, 199, Lewisham High-road, London, S.E.:—

Hall Bros.	£915	S. R. Best	£885
W. O. Collingwood ..	900		

GUILDFORD.—For the erection of flood gates, buildings, &c., at the waterworks, Millmead, for the Town Council. Mr. C. G. Mason, C.E., Tuns Gate, Guildford:—

Stevens & Sons £507
Tribe & Robinson, Guildford* 475

LLANDILO.—For reconstructing Bethel Methodist chapel, Llansauel, for the Building Committee. Mr. David Jenkins, architect, Llandilo:—

Daniel Davies, Talley, Llandilo* £660

LONDON.—For the erection of stables at Chelsea for Mr. H. Covington. Mr. T. Wilson, architect, 34, New Bridge-street, E.C.:—

Patman & Fotheringham	£3,650	Wall & Co.	£3,439
Whitehead & Co. ..	3,615	Gould & Brand	3,420
C. Wall	3,590	Nightingale	3,396
		Chessum & Sons....	3,320

LONDON (Stepney).—For the erection of two blocks of workmen's dwellings, Dorset-street, Limehouse, for the Stepney Borough Council. Mr. M. W. Jameson, Borough Engineer, 15, Great Alie-street, Whitechapel, E.:—

Courtney & Fairbairn	£6,985 0	Martin, Wells, & Co.	£6,552 0
Harris & Wardrop	6,980 0	H. L. Holloway	6,539 0
Patman & Fotheringham	6,973 0	Shelbourne & Co.	6,473 0
L. F. Lamplough	6,937 0	S. E. Moss	6,346 10
Arthur Porter	6,804 0	Thomas & Edge	6,326 0
Wall & Co.	6,797 0	A. E. Symes, Carpenters-road, Stratford, E.*	6,298 0
Sabey & Son	6,750 0		
R. & E. Evans ..	6,581 0		

LONDON.—For lighting of new buildings, Wentworth-street Depot, Whitechapel, for Stepney Borough Council. Mr. M. W. Jameson, Borough Engineer:—

Ward Bros.	£260 10 0	Christie, 3 & 5, Mansell-street*	£162 10 0
Tamplin & Makovski	234 13 6		
Barlow Bros., & Co.	189 0 0		

MIDSOMER NORTON (Somerset).—For the carrying-out of Contracts 1 and 2 in connexion with proposed works of additional water supply for the Urban District Council. Mr. William F. Bird, Engineer, Midsomer Norton:—

	Contract No. 1. £ s. d.	Contract No. 2. £ s. d.	Total. £ s. d.
J. E. James	882 10 0	4,668 12 0	5,550 2 0
S. Wood	1,249 13 8	4,208 15 0	5,458 8 8
W. Thomas	1,147 10 0	3,769 7 0	4,916 17 0
A. Webb	894 7 10½	3,187 16 9½	4,082 4 8
Wills & Sons ..	998 0 0	2,997 0 0	3,995 0 0
J. Bird	963 16 4	3,016 3 8	3,980 0 0
W. A. Catley*..	795 0 0	3,161 0 0	3,956 0 0
Bevan & Sons..		3,968 10 6	
Smith & Marchant		3,344 17 9	
J. Macdonald ..		2,972 7 10	

[Engineer's estimate ..... £3,933 7 6]

OXSHOTT (Surrey).—For the erection of detached cottage residence, for Mrs. A. Martin-Cobbett. Mr. S. Doddimeade Edmunds, architect and surveyor, 79, Victoria-street, St. Albans:—

A. F. Mitchell	£1,115	A. Gower, Cobham* ..	£775
H. Joyce	880	Vail & Williamson (withdrawn)	724
C. Horsell	820		
Cropley & Sons	802		

RIDGE.—For rebuilding the "Old Guinea," for Benskin's Watford Brewery Co., Ltd. Mr. Percival C. Blow, architect, 7, London-road, St. Albans:—

W. Sharp	£1,907	Boff Bros., Park-street (amended and accepted)	£905
Miskin & Son	970		
Jt. Bushell	938		

ALDERSHOT.—For council offices, &c. Mr. C. E. Hutchinson, architect, John-street, Bedford-row, W.C.:—

—	Fire Station. £ s. d.	Offices. £ s. d.	Paths, &c. £ s. d.	Total. £ s. d.
Parnell & Son	2,653 0 0	6,106 0 0	252 0 0	9,011 0 0
Higgs & Outhwaite	2,625 0 0	6,040 0 0	260 0 0	8,925 0 0
Foster & Dicksee	2,403 0 0	6,164 0 0	321 0 0	8,888 0 0
Holliday & Greenwood	2,356 0 0	6,194 0 0	298 0 0	8,847 0 0
Kirk & Randall	2,520 0 0	5,950 0 0	225 0 0	8,695 0 0
Lorden & Son	2,340 0 0	6,058 0 0	268 0 0	8,666 0 0
B. E. Nightingale	2,547 0 0	5,835 0 0	283 0 0	8,665 0 0
Lawrence & Son	2,313 0 0	5,869 0 0	267 0 0	8,449 0 0
Mitchell Bros.	2,340 0 0	5,830 0 0	251 0 0	8,421 0 0
Peerless, Dennis, & Co.	2,279 0 0	5,878 0 0	227 0 0	8,384 0 0
Jenkins & Son	2,345 0 0	5,872 0 0	236 0 0	8,375 0 0
E. C. Hughes	2,241 1 5	5,826 15 4	253 0 0	8,321 16 9
Geo. Kemp	2,232 0 0	5,663 0 0	217 0 0	8,112 0 0
Tompsett & Co.	2,245 0 0	5,637 7 0	225 0 0	8,107 7 0
Goddard & Son	2,290 0 0	5,550 0 0	260 0 0	8,100 0 0
Frank Milton	2,192 10 0	5,612 0 0	236 10 0	8,040 0 0
F. G. Minter	2,220 0 0	5,439 0 0	152 0 0	7,811 0 0
Martin, Wells, & Co.	2,112 10 0	5,353 0 0	181 3 0	7,646 13 0
J. Harris, Basingstoke†	2,058 6 8	5,139 1 5	205 15 2	7,403 3 3

[See also next page.

ST. ALBANS.—For residence, Spencer Park, for Mr. H. W. Edwards. Mr. Percival C. Blow, architect, 7, London-road, St. Albans :—

W. Sharp	£1,154 10 0	Hammond & Son	£1,079 17 5
F. Stanley	1,150 0 0	Tyler & White	1,050 0 0
Vail & Co.	1,143 15 0	Warton & Dunstall	1,024 0 0
Whibley & Jervis	1,140 0 0	C. W. Dumpleton, St. Albans*	975 0 0
J. T. Bushell	1,128 16 5		
E. Dunham	1,111 0 0		

ST. ALBANS.—For residence, Kingsbury-road, for Herr Keller. Mr. Percival C. Blow, architect, 7, London-road, St. Albans :—

Whibley & Jervis	£753 10	W. Sharp	£662 17
J. T. Bushell	749 12	Dumpleton	622 0
E. Dunham	695 0	Hammond & Son*	584 0
F. Stanley	675 0		

ST. ALBANS.—For cottage for Miss Rowe, Sandridge-road. Mr. Percival C. Blow, architect, 7, London-road, St. Albans :—

J. T. Bushell	£275 0	Goodchild & Sons	£240 0
Dumpleton	247 10		

ST. ALBANS.—For the erection of a detached residence, Clarence-road, St. Albans. Mr. S. Doddimeade Edmunds, architect and surveyor, 79, Victoria-street, St. Albans :—

Goodchild & Sons, St. Albans* £560

ST. ALBANS.—For the erection of proposed engineering works, The Camp, for Messrs. J. W. Flower & Co. Mr. S. Doddimeade Edmunds, architect and surveyor, 79, Victoria-street, St. Albans :—

Goodchild & Jeffry	£2,512 0	Whibley & Jervis	£2,420 0
Boff Bros.	2,475 0	Miskin & Sons	2,406 0
		E. Dunham	2,357 10

WATFORD.—For the erection of detached residence, Whippendale-road, Watford, for Mr. R. John. Mr. S. Doddimeade Edmunds, architect and surveyor, 79, Victoria-street, St. Albans :—

Henry Brown, Watford* £799

WIRRAL (Cheshire).—For the construction of the Fender Valley Outfall Sewer for the Rural District Council. Messrs. Beloe & Priest, C.E., 13, Harrington-street, Liverpool :—

Lee & Son	£53,600 0 0	Read & Sons	£34,000 0 0
J. Byrom	51,107 0 0	Kellett & Sons, Ltd.	32,817 0 0
J. & T. Binns	41,813 11 0	H. E. Buckley	32,182 16 9
Bennie & Thompson.	40,682 19 6	W. Roberts	29,690 0 0
Johnson & Son	35,873 0 0	G. Bell	28,388 11 4
Graham & Sons	35,231 0 0	Thomas & Sons, Oxton, Ches.*	28,000 0 0
Johnson & Langley	34,951 12 5	Ainsworth & Son‡	26,547 15 7
Bower Bros.	34,698 0 0		

‡ Withdrawn.

WOOTTON.—For the erection of a private residence on Sea Copse Hill Estate, Wootton, Isle of Wight, for Mr. Thomas Boys. Mr. John I. Barton, architect, Ryde :—

Wheeler Brothers	£1,050 0	T. & E. W. Jenkins	£1038 10
Please jun. & Co., Wootton*	£1,018 10		

B. NOWELL & CO.
STONE MERCHANTS & CONTRACTORS.
Chief Office.—*Warwick Road, KENSINGTON.*
Norway, Guernsey, and Leicestershire Granite, Kerb, Pitching, and Yorkshire Stone.
ESTIMATES GIVEN FOR EVERY DESCRIPTION OF ROAD MAKING.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to J. MORGAN) should be addressed to the publisher of "THE BUILDER," Catherine-street, W.C

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office 19s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers) can ensure receiving "The Builder" by *Friday Morning's Post.*

PUBLISHER'S NOTICES.

THE INDEX (with TITLE-PAGE) for VOLUME LXXXIII. (July to December, 1902) was given as a supplement with the number for January 10th.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each ; also

READING CASES (Cloth), with Strings, price 9d. each.

THE EIGHTY-THIRD VOLUME of "The Builder" (bound) price Twelve Shillings and Sixpence, is NOW READY.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, &c. &c.

Six lines, or under ..... 6s. 0d.
Each additional line ..... 1s. 0d.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade advertisements, and for front page, and other special positions, on application to the Publisher.

SITUATIONS WANTED (Single-handed—Labour only).
FOUR lines (about thirty words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps *must not* be sent, but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Outside Wrapper should be in by TWELVE noon on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder" may have *Replies addressed to the Office*, Catherine-street, Covent Garden, W.C. *free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES, { NINEPENCE EACH. By Post (carefully packed) 1s.

J. J. ETRIDGE, Jr.
SLATE MERCHANT,
SLATER and TILER.
Penrhyn - Bangor,
Oakeley - Portmadoc,
And every other description of Slates, except American, Ready for immediate delivery to any Railway Station.
RED SANDFACED NIBBED ROOFING TILES ALWAYS IN STOCK
Applications for Prices, &c., to BETHNAL GREEN SLATE WORKS, BETHNAL GREEN, LONDON, E.

THE BATH STONE FIRMS, Ltd.
BATH.
FOR ALL THE PROVED KINDS OF
BATH STONE.
FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

HAM HILL STONE.
DOULTING STONE.
The Ham Hill and Doulting Stone Co.
(incorporating the Ham Hill Stone Co. and C. Trask & Son, The Doulting Stone Co.).
Chief Office :—Norton, Stoke-under-Ham, Somerset.
London Agent :—Mr. E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co.

SPRAGUE & CO., Ltd.,
LITHOGRAPHERS AND PRINTERS.
Estate Plans and Particulars of Sale promptly executed.
4 & 5, East Harding-st., Fetter-lane, E.C.

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch. [Telephone No. 434 Westminster.
METCHIM & SON { 8, PRINCES STREET, S.W. and 32, CLEMENT'S LANE, E.C.
"QUANTITY SURVEYORS' DIARY AND TABLES," For 1903, price 6d. post 7d. In leather 1/- Post 1/1.

JOINERY
Of every description and in any kind of Wood.
CHAS. E. ORFEUR,
ESTIMATES ON APPLICATION.
COLNE BANK WORKS, COLCHESTER.
Telephone : 0195. Telegrams : "Orfeur, Colchester."

ASPHALTE
For Horizontal & Vertical Damp Courses.
For Flat Roofs, Basements, & other Floors.
Special attention is given to the above by
THE
French Asphalte Co.
Contractors to
H.M. Office of Works, The School Board for London, &c.
For estimates, quotations, and all information, apply at the Offices of the Company,
5, LAURENCE POUNTNEY HILL,
CANNON STREET, E.C.

TWELVE GOLD AND SILVER MEDALS AWARDED.
COPPER AND ZINC ROOFING.
F. BRABY & CO.

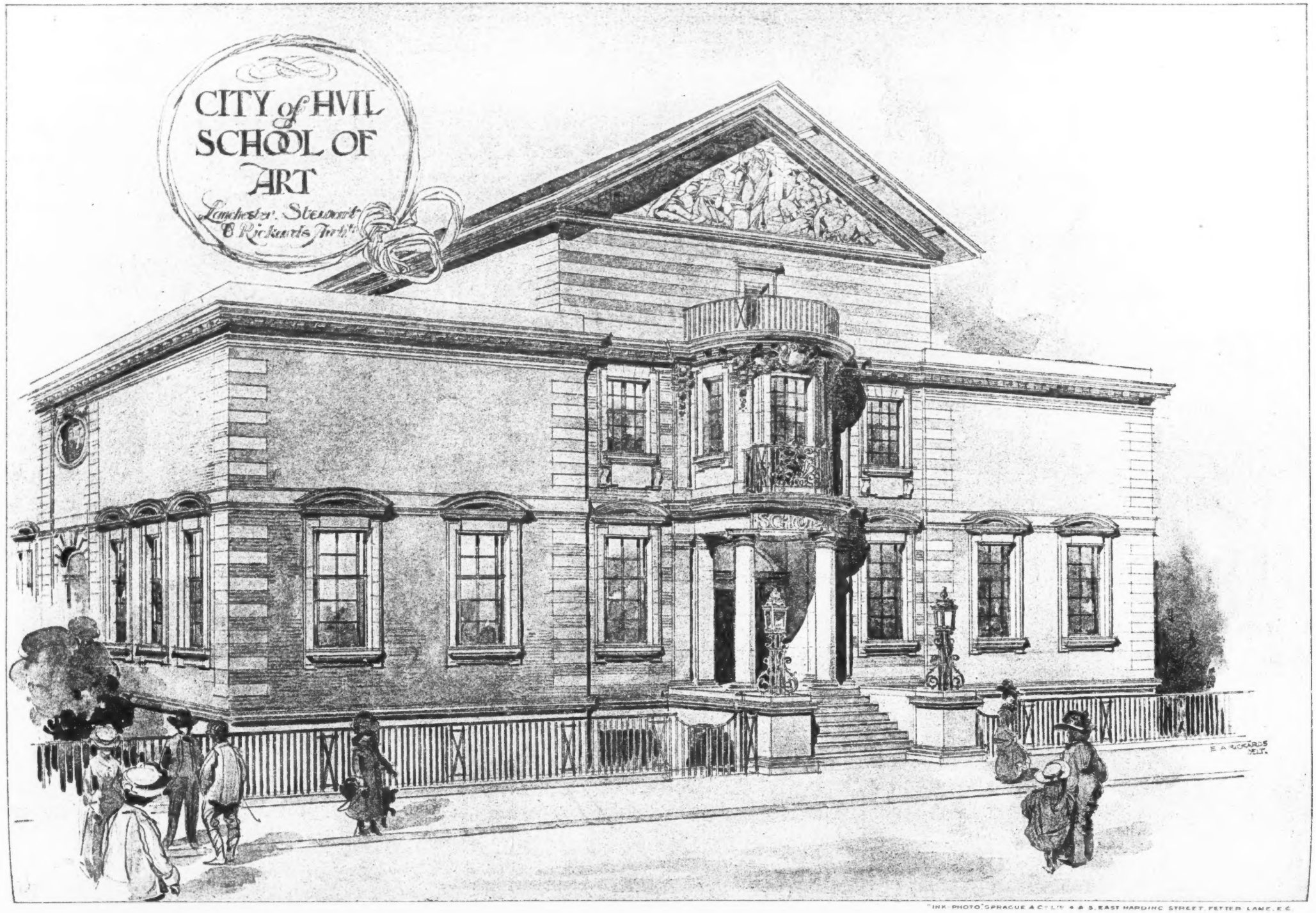
LONDON.	LIVERPOOL.	GLASGOW.	BRISTOL.
352 to 364, Euston-rd., N.W.	6 & 8, Hatton Garden.	47 & 49, St. Enoch-square.	Ashton Gate Works, Coronation-rd.

VIEILLE MONTAGNE SOLE MANUFACTURING AGENTS.
NO SOLDER. NO EXTERNAL FASTENINGS.
Particulars on Application. Chief Offices : Fitzroy Works, EUSTON ROAD, LONDON, N.W.

INK-PHOTO, SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

S. GIOVANNI AND PALAZZO MICHELETTI, FROM CATHEDRAL, LUCCA.

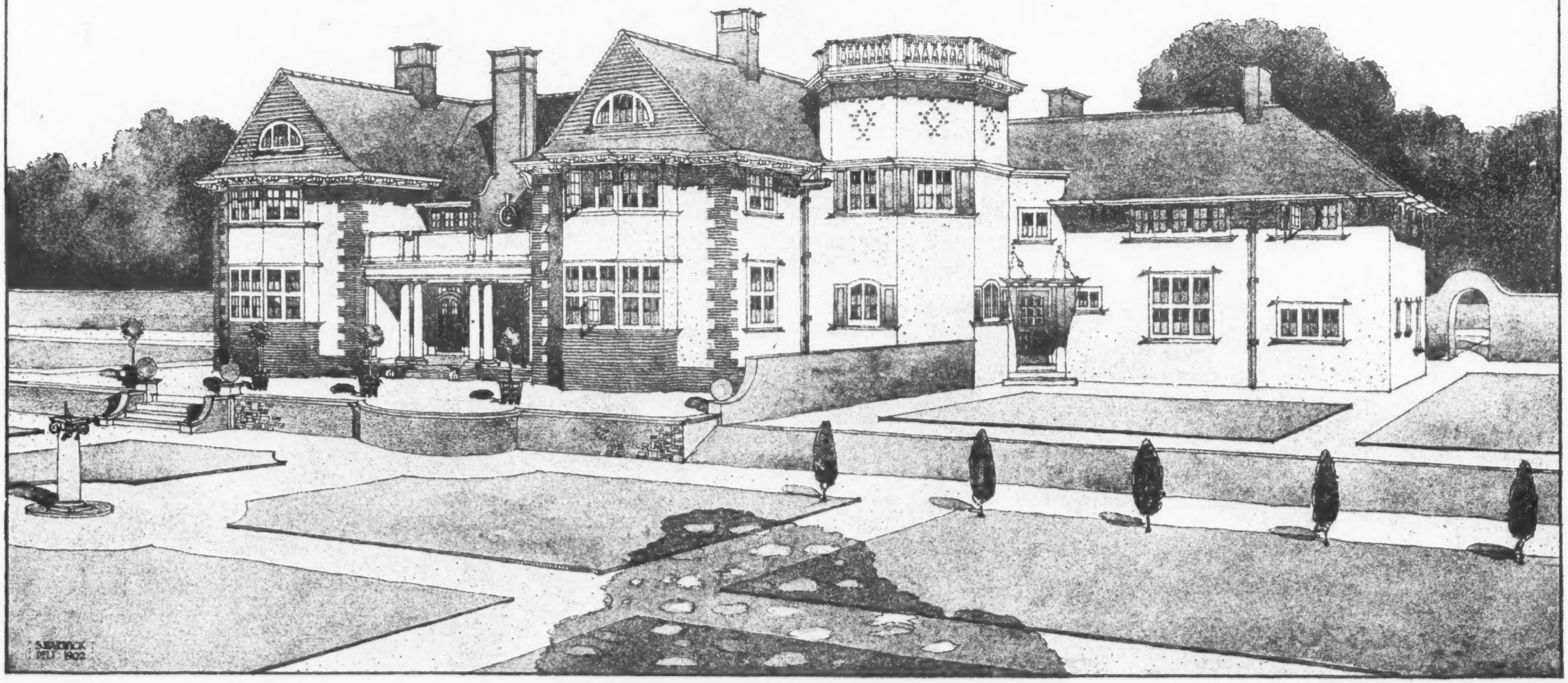
FROM A DRAWING BY MR. FRANK T. VERITY, F.R.I.B.A.



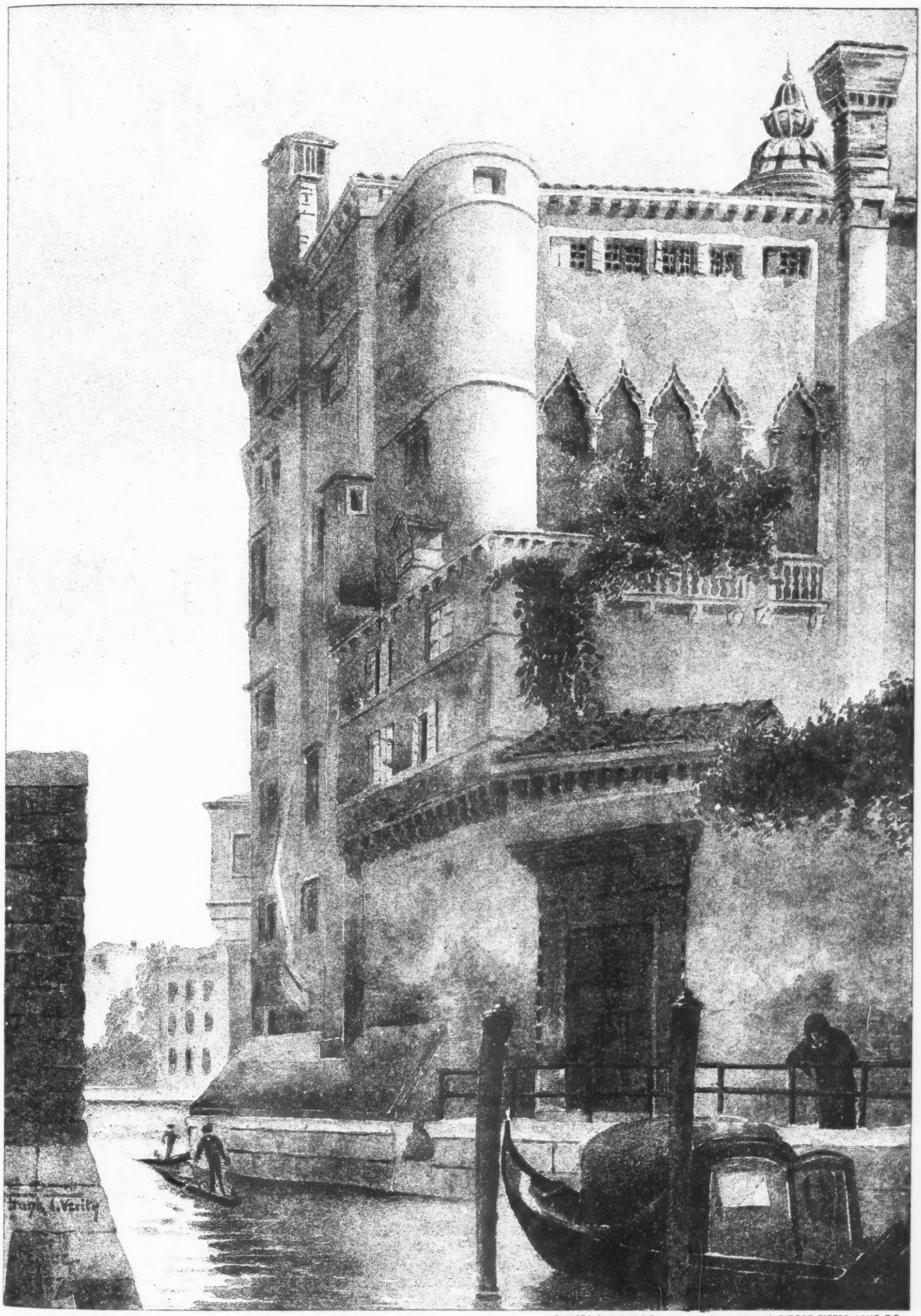
"INK-PHOTO" SPRAGUE & Co. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

HOUSE NEAR SKIBBEREEN Co. CORK.

R. S. BALFOUR, A.R.I.B.A., Archt.



"INK-PHOTO" SPRAGUE & Co. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.



INK-PHOTO. SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

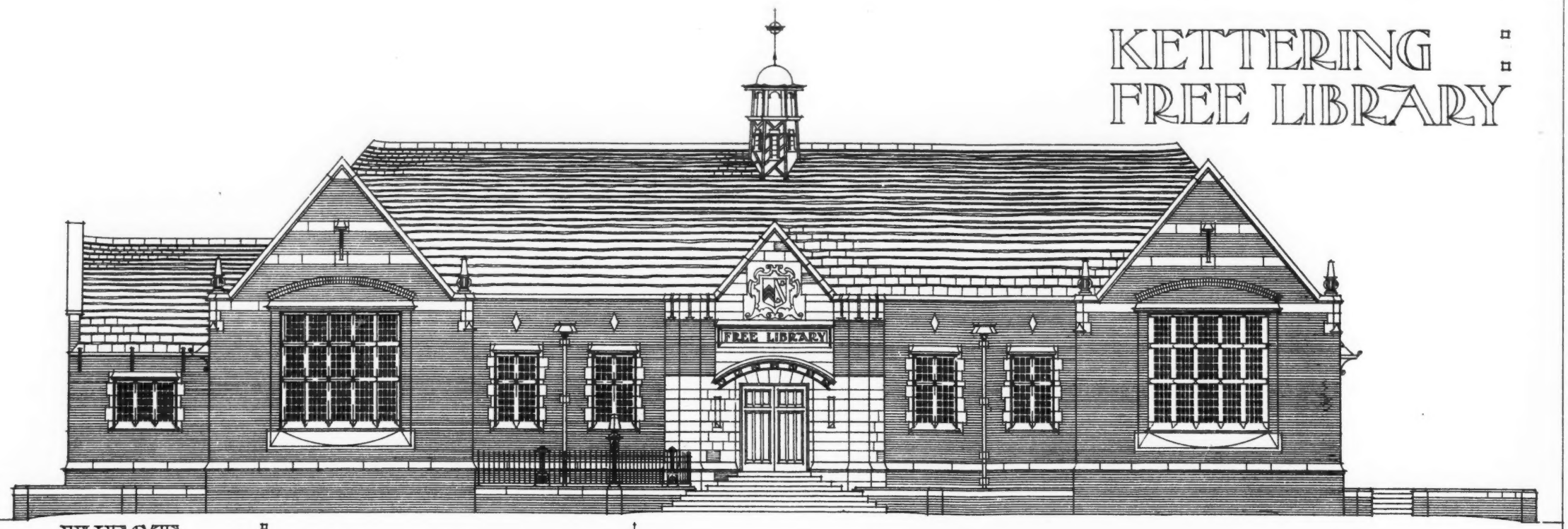
PALAZZO CONTARINI, VENICE.

FROM A DRAWING BY MR. FRANK T. VERITY, F.R.I.B.A.

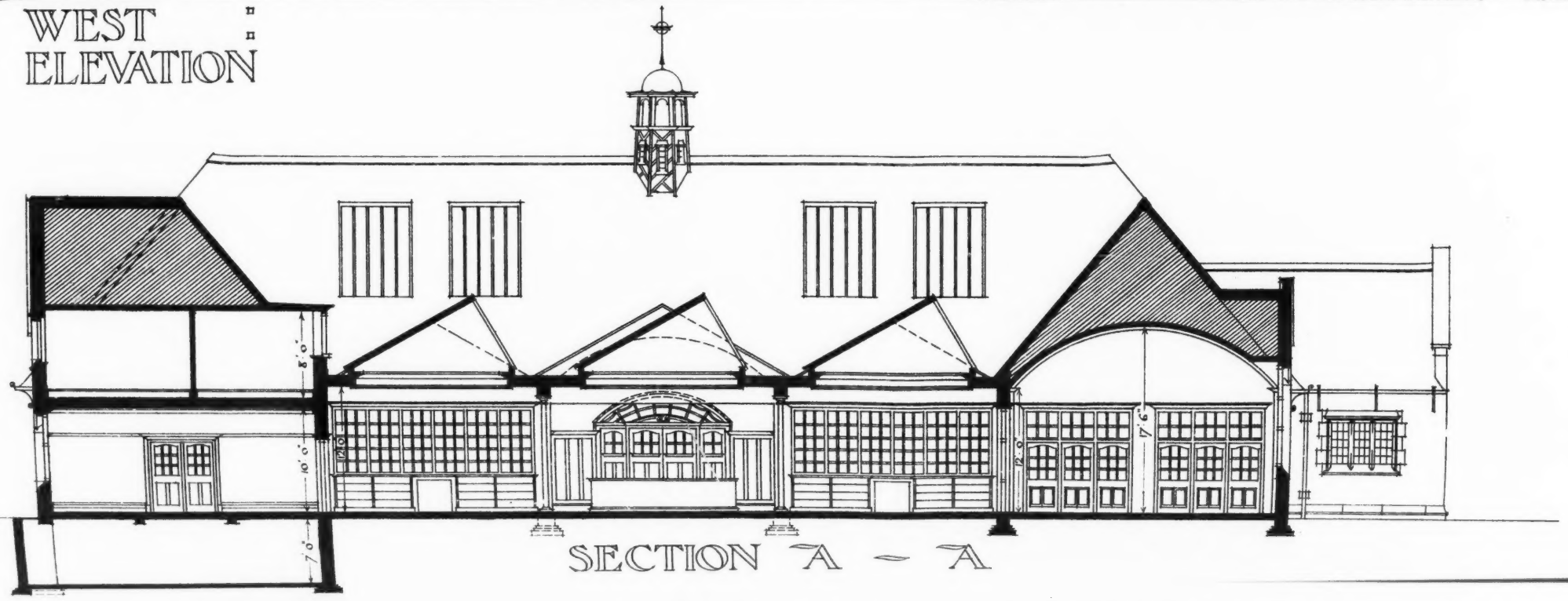
Sprague & Co., Ltd., Printers, 4 & 5 East Harding St., E.C.

DETAIL OF THE CENTRAL DOOR OF THE CATHEDRAL OF SIENA.

KETTERING FREE LIBRARY



WEST ELEVATION



SECTION A - A

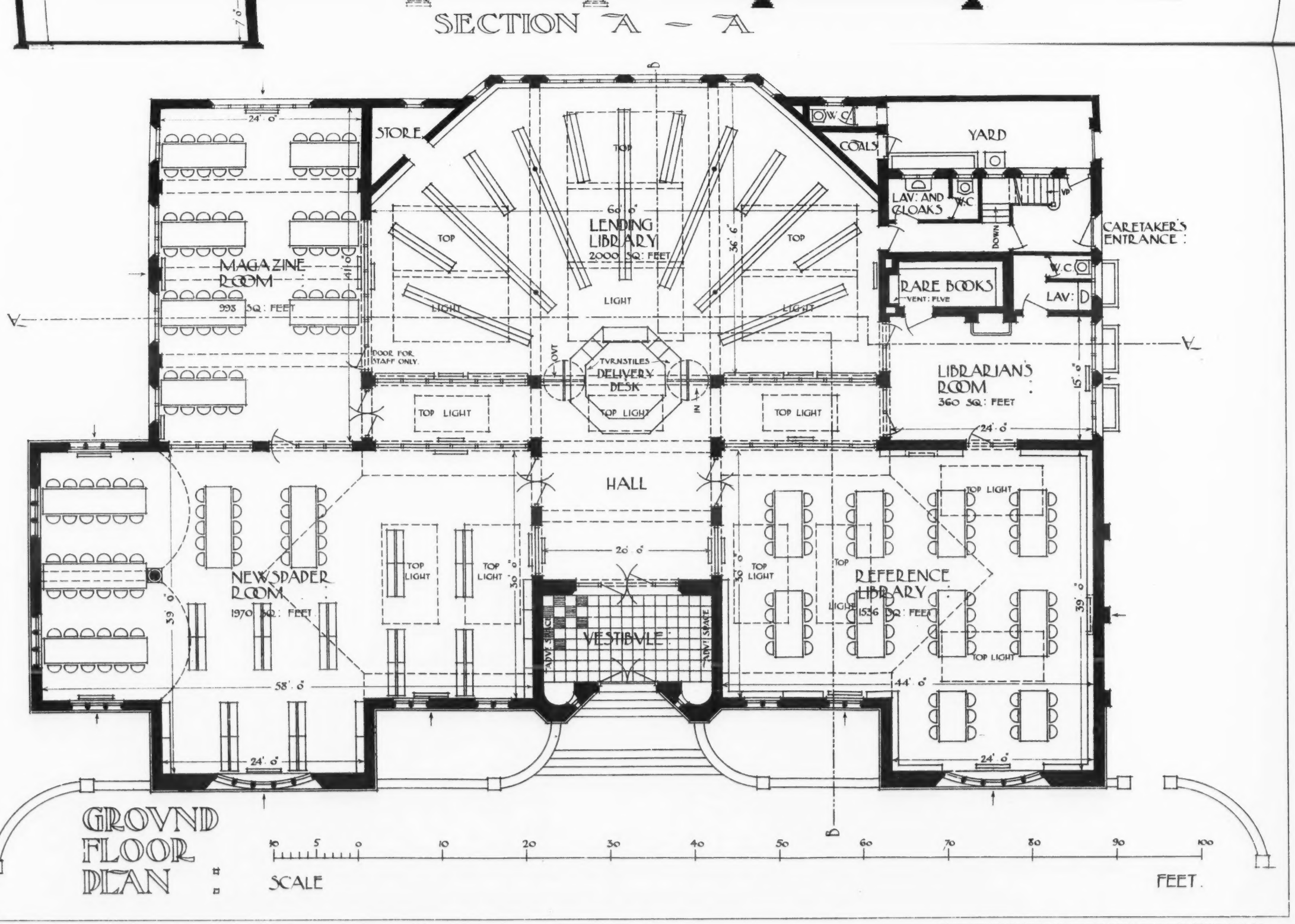


PHOTO LITHO. SPRAGUE & Co. LTD 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

SELECTED DESIGN FOR FREE LIBRARY, KETTERING.—Messrs. Goddard & Co., Architects